BULLETIN

MADRAS DEVELOPMENT SEMINAR SERIES

VOLUME V NUMBER 4 April 1975

74, SECOND MAIN ROAD, GANDHI NAGAR,
ADYAR, MADRAS-600 020.

MONTHLY BULLETIN

Vol. V No. 4

CONTENTS

			Page
1.	Editorial—Some Highlights		
	I. General Economic Scene	...	193
	II. Agriculture	...	214
	III. Industrial Production	...	217
	VI. Education, Science and Health	...	220
	V. Employment	...	223
	IV. Other Items	...	225
2.	Energy Problems in Tamil Nadu *By Prof S. Sampath*	...	229
3.	Countering Stagflation in the in the Indian Economy	...	255
4.	Book-Review	...	258

EDITORIAL—SOME HIGHLIGHTS

1. General Economic Scene

State:

Second Annual Plan : The approved outlay of the State's First Annual Plan was finally established at Rs. 112 crores, with the Union assistance at Rs. 41.15 crores (see Vol IV p 407), despite the many attempts to establish it at Rs. 165 to Rs. 151 crores (see Vol IV pp 253, 327-329). The Second Annual Plan starting April 1, 1975 has been established at Rs. 142 crores. The State government had drawn up a plan for Rs. 162.83 crores, which was then reduced by both the State government and the Union Planning Commission to Rs. 139.77 crores and Rs. 139.59 crores respectively. For agriculture and allied services the State proposed Rs. 18.70 crores and the Union Planning Commission Rs. 28.37 crores which in 1974-75 was Rs. 19.18 crores, for water and power development the State proposed Rs. 45.61 crores and the Union Rs. 46.60 crores which was Rs. 38.11 crores in 1974.75, for transport and communication the State proposed Rs. 15.16 crores and the Union Rs. 15.68 crores while in 1974-75 it was Rs. 9.58 crores, for industry and minerals both proposed Rs. 8.27 crores compared to Rs. 9.20 crores in 1974-75, and for social and community services the State proposed Rs. 40.8 crores, and the Union Rs. 39.10 crores compared to the 1974-75 outlay of Rs. 32.02 crores. The Union assistance for the Second Annual Plan will be the same Rs. 41.15 crores as that of last year, which means that the State will have to raise additional resources both for the Plan and to make up for the loss of revenue on the prohibition and banning of horse races. The arrears of Rs. 5 crores of urban land tax should be collected and is one important resource. The approved Second Year Plan is higher for every sector except for industry and minerals for the second year compared to the first year. But the first 2 year plans totalling Rs. 252 crores are not even 30 percent of their share of the Fifth Plan of Rs. 1,234 crores, recommended by the State Planning Commission and adopted by the government (see Vol IV pp 328-329).

1975-76 State Budget : The 1975-76 State budget presented to the legislature on March 1, reflects the drought problems, the declining resources position consequent on the reversion to prohibition in the State (see Vol IV p 578), the inflationary impact on salaries and wages, the power shortage as well as the development demands as embodied in the State's Fifth Plan (see Vol IV pp 327-329). The budget may be summarised as follows : (a) receipts on revenue account are Rs.501.37 crores (Rs.498.50 crores revised for 1974-75) & expenditures are Rs. 537.50 crores (Rs. 510.33 crores revised for 1974-75) which gives a revenue deficit of Rs. 36 crores for 1975-76, compared to the revised revenue deficit of Rs. 11.83 for the previous year. Against this, the normal increase in sales tax will be

Rs. 26.4 crores, reducing the revenue deficit to Rs. 9.7 crores to which, due to the left over of prohibition losses, abolition of horse racing, remission of land revenue because of the drought and decline in electricity taxes consequent on their merger with the tariff, an excise revenue decline of Rs. 22.1 crores should be added. Against this Rs. 31.8 crores short fall, Rs. 6 crores is to be raised by additional taxes, giving a deficit of Rs. 25.8 crores and taking all sources, the overall deficit amounts to Rs. 26.6 crores Unlike last year's budget, the one for 1975-76 has less uncertainities and if the drought relief expenditures are maintained at Rs. 57 crores, for which the 1975-76 provision is Rs. 20 crores, and the Union government contributes its expected share of Rs. 22.5 crores towards this item, the deficit will not only not increase but will be substantially reduced. (b) The capital outlay provided in the budget is Rs. 41.7 crores, loan and advances Rs. 42.13 crores including open market borrowing at Rs. 27.55 crores, and repayments to the Union government is Rs. 42.35 crores. (c) The budget represents an additional resource mobilisation of Rs. 6 crores largely through sales tax and stamp duty adjustments : (i) increasing sales tax on coffee and tea from 5.5 to 6 percent, on oils, matches, pulses and grams, from 3.5 to 4 percent, on certain electrical goods and perfumes from 9 to 12 percent, and on cotton and cotton yarn from 2 to 3 percent, (ii) a 5 percent sales tax in prawns, lobsters, crabs and frogs legs, exempting those with turnover of less than Rs. 5,000 a year and (iii) increase in stamp duty through merging and rationalising it. These levies are on middle and upper class consumption of goods and services and will have only marginal effect on the price level. (d) The plan outlay for 1975-76 as noted earlier is Rs. 142 crores, but taking into account, extra budgetary development expenditures by statutory and public bodies will be Rs. 170 crores, just as the 1975-76 approved plan outlay of Rs. 112 crores with extra budgetary resources amounted to Rs. 158.42 crores. The major plan development provisions including the following : (e) Under agriculture, State seed farms of 100 acres each will be established in the coastal districts to extend tapioca cultivation to 1 lakh acres, IADP will be extended to the 4 remaining districts of Ramanathapuram, Salem, Dharmapuri and Kanyakumari so as to ensure coverage of the entire State, the summer crop to bring 5 lakh acres under paddy, and six lakh acres each under coarse grains and pulses, a new exotic cattle development project in Thanjavur to be implemented with pedigree cattle imported from Denmark, the building of 250 mechanised boats by the Fisheries Development Corporation and a fishermen's housing programme starting this year with 5,000 houses for Rs. 2 crores. (f) 8 new irrigation schemes to bring 33,000 acres under irrigation, and stabilise irrigation in 18,000 acres at a total cost of Rs. 20.2 crores, increasing the Parambikulam - Aliyar ayacut by 89,000 acres and a special minor irrigation programme of Rs. 3.5 crores. (g) Under power a fifth 110 MW set to be added at Ennore, where, with the help of BHEL, power generation is to be doubled during the year, completing Kundah IV stage by 1976-77 and Suruliayar and the first unit at Tuticorin by 1978-79. (h) In industries, the programme comprises a joint sector project in fertilisers, chemicals, salt, castings, cells, cigarettes and T. V. sets, SPIC, TANSI projects for mopeds and machine tools and SIPCOT complexes at Hosur and Manamadurai—all to become operational during the year. Also a social security scheme for handloom weavers and a request to the Union government for Rs. 3 crores to relieve the accumulation

of handloom products were announced. (i) Under education, the expansion of the comprehensive schools programme (see Vol IV pp 694-695) and the launching of the Tamil Nadu Technological University which the UGC has finally approved (j) Under health, intensifying the family planning programme and adding 12 bed wards for ex-servicemen in 16 taluk hospitals (k) Under Harijan welfare, the Harijan Housing Corporation will complete the 15,000 houses construction, 100 Harijan hostels and 50 backward class hostels (1) In addition the government announced a new DA decision for its employees, teachers in aided institutions and local bodies, on the Union government formula, which involves 9 DA instalment as 36 percent of pay for those drawing less than Rs. 300 a month and 27 percent for the others—costing the government 24.5 crores against the Rs. 12 crores involved in the decision last January (see last issue p. 164) The budget is thus a sound holding operation in the midst of the many difficulties and uncertainities facing the State. The question raised once more is in regard both to the annual budget and the annual plan about the unsatisfactory relations in regard to development programming, planning and financing as between the Union authorities and the State. There is no real exchange of information between the two, no clear cut division of responsibility between them, and no chance of establishing a long range policy by the State in regard to development and eradication of poverty which is its primary responsibility. The State with its heavy responsibility for the progress and welfare of its people is on the margin in terms of responsibiliy and resources in developmental matters. Until this is righted, there will continue to be lack of coherence and consistency in Union and State Planning, and limited progress in the attainment of the national policy objectives set forth in the Draft Fifth Plan document.

Drought and food grains supply: The State continued in the grip of the drought. The immediate impact was shortage of drinking water in Madras city which will be dealt with later, and in rural areas in 7 districts referred to in Vol V p 69. In the Pudukottai camp for Sri Lanka repatriates, lack of water and food caused sickness and some infant deaths. By the end of February, the government had allocated Rs. 10 crores for drought relief out of the Rs. 55 crores for the whole relief programme, involving employing 61 lakh persons in the next 9 months. The first two annual Plan provisions are being diverted, concentrated and accelerated to benefit the drought hit villages to the extent of Rs. 25 crores. In addition the Union government has been requested to provide Rs. 10 crores from the 1974-75 budget and Rs. 20 crores from the 1975-76 budget. In early February, the Union government allocated Rs. 7.5 crores for drought relief in this State from its 1974-75 budget, to give employment to 5.9 lakh persons in February and 9 lakhs in March. In addition, as noted in the last issue pp 135-136 against the monthly need of 1 lakh tonnes, the Union government is providing 50,000 tonnes of wheat per month, increased to 60,000 tonnes for March and is facilitating the movement of coarse grains into the State. The prospects of rice from the central pool are not very bright, as its stock of rice is not very large. Neighbouring Andhra Pradesh also is suffering from the drought in parts of Nellore district, with the failure of the paddy crop in that area and a rise in the price of rice. This State government revised the price of rice that is issued through the public distribution system (see Vol V p 70) to take account of the incentive bonus and the transport and

incidental charges. The revised prices are Rs. 1.80 per kilo coarse, Rs. 1.90 for medium, Rs. 2 for fine and Rs. 2.10 for superfine. Without an adequate stock, these prices cannot be enforced. CSO's monthly abstract shows a jump in food grain prices from 248 to 327 between January and August 1974 in this State, from 235 to 362 in the same period of consumer prices for agricultural labourers, and a sharper spurt in Madurai which went from 226 to 280 and Tiruchi which went from 229 to 286 than in Madras which rose from 240 to 280 in the 8 month period. The drought which happened 3 months later has sent prices further up and worsened the living levels of the rural poor—rice at around Rs. 4 per kg, milk up by 40 paise per litre, oils by 60 paise per litre and vegetables by 40-50 paise per kg.

Power : The power situation in February in the State worsened and there is the prospect of a further cut beyond the 60 percent currently in force. The immediate cause for the worsening situation is the water famine. The Basin Bridge Plant which generates 55 MW reduced its production to 25 MW because the city corporation could supply only 1.5 lakh gallons of water a day instead of the 3 lakh tonnes it needs. Similarly the Ennore plant which is being fed byground water faces a lowering of the ground water table, and so a further reduction over and above the technical malfunctioning of the boilers which reduced its generation from 340 MW (going upto 450 MW when its fifth 110 MW limit goes into operation in September), to 50-60 MW. Towards the end of February Set No 1(60 MW) and Set No.3 (110MW) were made to function, generating 125 MW Set No. 4 (110 MW) should be ready in March and Set No. 2 (60 MWs) in April. Neyveli is still without its second oil fired boiler and hydel generation is fast declining as the 724 million units storage by mid February will be wiped out by mid April. In addition Kerala which is normally power surplus, due to the depleted storage in its hydel reservoirs (570 mcm against 845 mcm) following the failure of the North East Monsoon has imposed power cuts on temporary illumination and display. Similarly Kothaguden in Andhra Pradesh which was commissioned only in January (see last issue p 137) went out of commission in February due to defective operations as in the case of Ennore. Despite its shortage, Kerala supplied from mid February daily 50,000 units of power for Tamil Nadu's cement units to receive 50,000 tonnes of cement in exchange. Also gober gas plants are being installed in villages with adequate cow dung. The plants are being fabricated at Virani. The long range power prospects for the State are as grim as the immediate situation. The short term power demand is 9,000 million units (MU) and 1,650 MW for peaking capacity against which the current generation is 7,100 MU and the peaking capacity 1,000 to 1,100 MW. On the basis of an equal 10 to 15 percent annual increase in demand and generation, the future is as follows : The 11 approved power projects (9 in the State section) call for an expenditure of Rs. 260 crores (annual allocation of Rs 50 crores). In addition new projects like Tuticorin must be speeded, Kalpakkam expanded and the second mine cut in Neyveli with a 1,000 MW plant brought into being, together with buying power for about 20 percent of our needs (300 MW) from Kerala and Andhra Pradesh. Even with all this, there will have to be a 20 percent cut upto the end of the Sixth Plan. As this Bulletin has repeatedly stated, the serious power deficit in the State is due to poor and bad planning by the Union authorities, whose non-action on this State's power plans was among other reasons, due to false prognosis on Neyveli's potential assessed at 600 MW.

For the Country as a whole the power supply was satisfactory only in 2 States-Kerala and Bihar (with some restrictions in Kerala), with Rajasthan which was in this group facing a power cut because it has to share 15 lakh units from its nuclear power plant with Punjab, Haryana and Uttar Pradesh, (which will not help as the deficit faced by these 3 States is 100 lakh units a day). Similarly Gujarat was in this group, but with the drought and the rapid increase in wells at the rate of 20,000 a year, over and above its 1 lakh energised wells has resulted in increased power cuts on industry in the State. All other States are in deficit—the total country demand in February being 222.62 million KWh, as againt the generation of 188.07 million KWh—a short fall of 34.55 KWh (increased from 26.96 million KWh in December). The highest short fall was in the Southern region (13.33 million KWh) followed by the Northern region (12 million KWh). Actually the power deficit in February was heaviest in Maharashtra (6 KWh 1 day), followed by Tamil Nadu (5.98), Karnataka (4.14), U. P. (3.74), Punjab (3.40), Andhra Pradesh (3.21), Haryana (2.90) and West Bengal (1.50). In February, also, the Rajasthan system was parallelled with Bhakra and Talcher with Balimea in Orissa in order to facilitate power exchanges. With the heavy snowfalls in January and February, the water level in Bhakra should increase and with the commissioning of more units at Badarpur, Bhatinda and Faridabad, the power situation should improve in the North. Meanwhile with the increased and uncertain nature of power cuts, industries in Maharashtra are losing heavily, so that projects like Tata's Trombay—Thermal (500 MW extension) should be pushed to make up for the 1,600 million unit cut in Koyna generation following from the Krishna water award. The most serious factor in this situation is the goverenment's admission that 45 percent of the installed thermal capacity is unproductive—the highest utilisation being Delhi 68 percent, Gujarat 65 percent, U. P. 62 percent and Andhra Pradesh 61 percent. Here is one area where early action can increase the available supply.

Cauvery Waters : The Chief Ministers of Tamil Nadu, Karnataka and Kerala met with the Union Minister of Irrigation on February 15 and 16 in continuation of the November meeting at which there was agreement to set up a Cauvery Water Authority to operate the Cauvery agreement (see Vol V pp 3-4 and 72). The February meeting was preceded by Karnataka raising the question of Tamil Nadu saving its share of 100 tonnes over 15 years and producing alternative drafts to that of the Union government summarised in Vol V p 72. Kerala also produced similar alternatives. The result was no agreement was reached at the February meeting when the November agreements on certain major points was reopened. The main points on which there were disagreement among the 3 States were : (a) The yield was orginally computed at 740 tmc ft for 50 years if 100 years was taken and 670 tmc ft. if 75 years was taken. Karnataka and Kerala finally agreed to taking 740 tmc ft as the yield : (b) utilisation was by the fact finding (Union) Committee estimated at 566 tmc ft by Tamil Nadu, 177 tmc ft by Karnataka, and 5 tmc ft by Kerala—which gives a total of 748 tmc ft, which Karnataka and Kerala held to be proof of wasteful use of water by Tamil Nadu, on the basis of which the November decision on utilisation was 671 tmc ft :- 489 tmc ft Tamil Nadu, 177 tmc ft Karnataka and 5 tmc ft Kerala. On this Tamil Nadu denied any waste and demanded that its utilisation be established at 566 tmc ft, as the 489 tmc ft was simply a five year average : (c) on savings, Tamil Nadu

stated that it could save only 60 tmc ft; but was not all along the basin but at Mettur, by reducing the inflow from 380 tmc ft to 280 tmc ft over 15 feet years. Karnataka would not agree to the 15 years and wanted the waters saved as and when its projects were completed. It also wanted the difference between 740 tmc ft and 670 tmc, ft., that is 70 tmc ft to be divided between Tamil Nadu, Karnataka and Kerala in the ratio of 4:138:53. Kerala wanted a 71 tmc ft from the savings instead of 53 tmc, wanted to use it for power as well as irrigation, and wanted to draw its share from Bhavani and Amaravathi and not from reduced Mettur inflow. At this point, Karnataka opposed Kerala's proposal to use the saving for multi-purpose schemes. There is now a complete deadlock and the Tamil Nadu government backed by *all* the parties has requested the Union government to refer the Cauvery waters issue to a tribunal, which is a step back because it delays a decision, loses the advantage of the innovation of the CVA, and holds back the development in all 3 States. But with the position taken on the main issues and the fact that Pondicherry as a user (Karaikal) will also have to be brought in, there is no alternative but reference to a tribunal. The Union Government seems to harbour hopes of success in a further round of negotiations.

City Water : The Madras City water situation worsened in February. The month started with Cholovaram and Poondi being dry and Red Hills standing at 4.5 ft against a depth of 18.73 ft, resulting in availability of 600 mc ft against the normal storage of 6,000 mc ft. From February 6, the daily supply was decreased to 20 million gallons and was supplied only on alternative days. April and May will be worse months, when the supply may be further reduced to once in 3 days. Under these conditions it may be necessary for the schools and colleges in the cities to reopen after their summer vacations in August rather then in June-July. The government is negotiating a Rs. 2 crores loan from the LIC for tapping Palar ground water resources to relieve the city water famine. Actually the government advanced Rs. 1.2 crores to the Madras corporation to dig 12 wells in Palar near Kalpakkam and pump the water to Madras through the Veeranam pipe lines (see Vol II No 8 p 22). The drought condition in the State and the need to provide drinking water in Madras and some of the villages was one of the reasons for the Rs. 3 crores increase in the Second Annual Plan. Similar arrangements are being made to tap water from river beds for needy villages.

Railways : Southern Railways records improved all round performance for 1974-75, similar to the national record to be referred to under the railway budget. Railways earning for April-December 1974 increased by Rs. 9.16 crores compared to the previous year's 9 months due to a 10 percent increase in operational efficiency, 25 percent increase in freight rates and passenger fares and use of selective loading techniques, container wagons and other modern techniques. It carried 70 percent freight and 30 percent passengers and increased its export cargoes of iron ore (2.48 lakh tonnes) manganesite ore and 1.9 lakh tonnes of sugar. The only front on which there was no improvement was in restoring the 267 cancelled trains. It reports plans for electrifying the 364 Kms of Arkonam-Erode & Jalarpettai-Bangalore sections. In the interest of improving the movement of export cargoes, there is a case for electrifying the Madras-Vijayawada section.

Regional Co-operation : The 2 day conferences of Rehabilitation Commissio-

ners of Southern States in early February drew up programmes for the Burma and Sri Lanka repatriates resettlement, contributing at the same time to the State's development. For this, the projects should be part of the State's Plan and should be funded as far as plantation, housing and self-employment schemes are concerned, by the banks. It also agreed on increasing the ceiling on loans for housing and building stalls by refugees. The third Southern Regional Tourism Minister's conference also held in early February in Bangalore recommended that the tourist industry be treated as a priority industry for steel and cement allocations, that private entrepreneurs be given government land, electricity, water etc at concessional rates for building hotels and motels, that each State establish one important festival in which the others will participate, establish also one place in each State for Son et Luminare programmes, produce joint colour films(with Air India) and multivision programmes, send joint troupes abroad and attract tourists from West Asia and South East Asia. The 25th Annual Convention of the Travel Agents Association of India in Madras at the end of February was a good follow up of the regional conference in drawing up practical plans for this South Asia Tourism Year declared by the World Tourism Organisation. At the convention, RBI announced granting money changing licences to travel agents.

Welfare : The State government is preparing to launch in early June a welfare scheme for the rehabilitation of destitute and orphan children on the basis of a survey of destitute children to be undertaken by the Social Welfare ministry. The ministry is collecting information on the orphanages run by official and non official agencies and in light of the numbers involved will decide on the new institutions to be established.

National :

1975-76 Union Budget : The 1975-76 Union budget presented to the Lok Sabha on February 28 is on the whole a sound fiscal instrument. (a) On the revenue side, it raises Rs. 7,114 crores, including Rs.239 crores in new resources and proposes. an expenditure of Rs. 6,491 crores, giving, a surplus Rs. 623 crores compared to the revised revenue budget for 1974-75 of Rs. 6,485 crores receipts and Rs. 5,860 crores expenditures with a surplus of Rs. 625 crores. On the capital side, the receipts for 1975-76 are Rs.3,429 crores and expenditure Rs. 4,277 crores involving a deficit of Rs. 848 crores from which the revenue surplus of Rs. 623 crores should be deducted giving an overall deficit of Rs. 225 crores. For 1974-75, the capital receipts are Rs. 2,997 crores and expenditures Rs. 4,247 crores, giving a capital deficit of Rs. 1,250 crores and an overall deficit of Rs. 625 crores, as against the budgeted deficit of Rs. 126 crores. Against this five fold increase in the deficit for 1974-75, it is essential that the 1975-76 deficit be held down to budgeted figures of Rs. 22 5crores, particularly in view of some expenditures such as that on account of DA being left uncovered; (b) The additional taxes will bring in Rs. 288 crores, which is a heavy dose, when added to the Rs. 444 crores of additional taxes levied in the 2 budgets last year (Vol IV pp 262-265 and 634) and the cumulative Rs. 1,000 crores which this plus railways and P and T raised. From this Rs. 288 crores, Rs. 9 crores must be deducted for certain tax relief measures and Rs. 49 crores which is the State's share, leaving Rs. 239 crores for the Union budget as noted earlier. The new taxes are (i) excise-increase of duty on free sugar from 30 to 37.5 percent, tea by 10-15 paise, petrol by 10 paise, cement from 30 to 35 percent, aluminium by Rs. 2,000 per tonne,

tobacco and snuff Rs. 3 per kg, cigarettes by 5 percent, furnace oil 3 paise per litre, copper Rs. 3,500 per tonne, zinc Rs. 2,025 per tonne, dyes and glass 5 percent, electric coils, electronics and electric fans by 2.5 to 15 percent, cosmetics from 30 to 40 percent, air conditioners to 100 percent and refrigeration 125 percent, safes 20 percent, beedies from Re. 1 to 4.60 per thousand, rayon and synthetic yarn by Rs. 20 per kg and a new item under the Central excise tariff schedule covering all goods produced for sale (except those by very small producing units) at 1 percent ad valorem. The new taxes will affect the middle and upper classes and will have some inflationary effect (c) On the development side, there are two measures ; proposals to encourage savings and revive the capital market and the priorities in the financial allocations of the budget. On savings and investment inducement an incentive bonus scheme will apply to employees who do not withdraw money from the provident fund, further concession under the Income Tax Act for long term savings through the provident fund and life insurance, extending to 5 years the tax holiday concession to industries, exemption from wealth tax for 5 years to equity shares, for the restriction on dividends- (see Vol IV p 532), higher dividends can be declared and paid in 2 equal annual instalments when the present Act expires in 2 years and further fiscal concessions to be announced when the committee on Central costs submits its report. To channelise savings into high priority industries, income tax exemption is granted to new companies manufacturing fertilisers, pesticides, paper and cement and the 20 percent depreciation allowance is extended to the pesticide industry. On the other hand in the interest of equity, the income tax on closely held industrial concerns has been increased, the income tax exemption limit on salaried assesses for house rents, post graduate education of children and travel concessions have been liberalised, retrenchment compensation paid to worker upto Rs. 20,000 exempted from income tax, tax holidays for approved hotels limited to those which start before I April, 1981, the tax exemption on interest paid py non-banking companies limited, concessions on dividends paid out of tax holiday withdrawn, exemption from income tax of income from live stock, poultry and dairy farming limited to Rs. 10,000 per annum and depreciation on cars imported after 28 February 1975 completely removed, while allowing full depreciation on all makes of Indian cars. (d) On the priorities in financial allocations: (i) agriculture is given premier place with its allocation rising from Rs. 193 crores to Rs. 270 crores (Rs. 20 crores for ARC, Rs. 25 crores for DPAP, Rs. 22 crores for SFDAs-MFALs, Rs. 43 crores for the co-operative sector, and Rs. 23 crores for agricultural research), (ii) fertilisers will have Rs. 276 crores compared to last year's Rs. 192 crores (iii) power will have Rs. 140 crores from the Union Budget and Rs. 900 crores in the States Plans, (iv) coal raised from last year's Rs. 141 crores to Rs. 229 crores, (v) oil from Rs. 60 crores to Rs. 70 crores plus Rs. 61 from the cess (ONGC, Rs. 167 crores, oil India Rs. 60 crores) and (vi) similar increases to cement, paper, shipping and transport. Steel on the other hand has a lower allocation of Rs. 238 crores compared to last year's Rs. 240 crores, reflecting a lower priority (Bokaro Rs. 135 crores completing Stage II Bhilai Rs. 61 crores which is a slow down and the remaining Rs. 35 crores for HSL plants including a mere Rs. 5.15 crores for Salem, Vishakapatnam, and Vijaynagar, which, as will be pointed out under the State section, is disastrous (e) This means that the total plan outlay both Union and States will be 23 percent higher than last year—Rs. 5,960 crores compared to last year's Rs. 4,844 crores. This breaks down into Rs. 2,558 crores

for the Union Plan, and including extra budgetary resources is Rs. 3,154 crores, compared to last year's Rs. 2,136 crores and Rs. 2,629 crores respectively and Rs. 1,054 crores for State and Union territory Plans and with extra budgetory resources 2,806 crores compared to last year's Rs. 911 crores and Rs. 2,059 crores respectively. This increase in the plan outlay—both Union and State—is overdue if anything like the draft Fifth Plan rhythm is to be maintained. The State and Union territories will have an additional Rs. 700 crores for their plans which is not impressive as Union assistance is more or less stabilised and is a little relief, additional resource mobilisation of Rs. 200 - 300 crores by the States is called for if their plans are to be executed without reduction. What is essential is that there should be no reduction in the Plan outlay at the Union and State levels if the economy is to move out of its stagnation. Last year's increased deficit has been explained in terms of the inflation, the food subsidy going up from Rs. 100 crores to Rs. 290 crores, DA disbursements rising from Rs. 120 crores to Rs. 230 crores, and additional expenditures on defence (Rs. 270 crores), drought and floods (Rs. 161 crores) and for fertiliser imports, the core sector and public sector enterprises deficits (Rs. 126 crores). This year these items have to some extent been foreseen (except for DA costs) and should be so managed as not to reduce the projected investment. (f) The share of the States in the additional taxes will be Rs. 55.66 crores and from the higher sales tax on inter State sales will be Rs.38.25 crores (g) Market loans are placed at Rs. 532 crores on gross and Rs. 324 crores net, compared to last year's Rs. 696 crores and Rs. 494 crores. External loans (aid) is maintained at last year's level, Rs. 928 crores gross and Rs. 612 crores net—with one new element, Rs. 230 crores of oil credit from Iran, Iraq and Abu Dhabi. (h) There are some interesting fall outs. Science and Technology gets a 3-fold rise of Rs. 63 crores (CSIR Rs. 37.5 crores, New energy sources including solar, wind and chemical energy Rs. 60 lakhs). Education gets Rs. 20 crores more at Rs. 136 crores (UGC, youth centres, and adult literacy) and Family Planning gets Rs. 9 crores more at Rs. 68.4 crores and Public health Rs. 15 crores more at Rs. 102.3 crores. The budget thus represents a cautious forward move in raising additional resources, reviving the capital market, accelerating savings and investments and establishing clear inter sectoral priorities. The effectiveness of the budget as a fiscal instrument for the year's industrial and agricultural development will depend on the additional resources raised by the States, the avoidance of cuts in investment outlays and developing an effective distribution system-which is outside the budgeted frame work. There is also the issue of the Union-State financial relations which are unsatisfactory and which holds back State's programme's which are essentially developmental.

Railway Budget: In presenting the railway budget for 1975-76, the Union Minister also presented the revised budget for 1974-75 wherein the anticipated deficit of Rs. 52.79 crores is increased to Rs. 143.98 crores, primarily due to increase in expenditures. The total originating traffic for 1974-75 is 192 million tonnes, which is what was anticipated in August, despite the loss of 11.8 million tonnes due to the strike (Vol IV pp 582-583). The passengers traffic is less than anticipated, and hence the gross traffic receipts are Rs. 26 crores less. The promised saving of Rs. 50 crores are set off against the 3 increases in DA rates. Thus the 1974-75 revised budget's gross traffic receipts are Rs. 1,401.15 crores, total expenditure Rs.1,340.01 crores and dividend to general revenues Rs. 189.33 crores. For 1975-76, the Minister makes certain optimistic assumptions about an

economic revival, increased food grains movement as a result of good winter rains, increased iron ore and coal production, and improved hydel generation. On this basis, revenue bearing goods traffic is estimated to increase by 18 *million tonnes* to 190 *million tonnes*, Leaving passenger fares untouched, 3 freight rates —those for food grains including pulses, iron ore and manganese ore—have been marginally increased to bring in an additional Rs. 39 crores, as compensation for their being carried below operating costs. As a result a deficit of Rs. 15.97 crores has been converted into a surplus of Rs. 23.63 crores. Thus the 1975-76 budget is : gross traffic receipts Rs.1,670.80 crores, gross expenditures Rs. 1,449.95 crores, *dividend* to general revenues Rs. 197.88 crores and a surplus of Rs. 23.03 crores. In this rather attractive budget, there is some underestimation of working expenses such as the DAs to be paid, and the increased coal prices that will occur. But more serious is the small Plan outlay envisaged. Out of Plan outlay of Rs. 328 crores (last year Rs. 324 crores), leaving aside the effect of the price rise on the real resources available Rs. 10 crores goes to metropolitan transport, Rs. 10 crores to States road transport, Rs. 120 crores to *depreciation reserve*, leaving only Rs. 182.50 crores on capital account. This means that only 6,000 wagons will be purchased with multiple effects on the engineering industry. Above all the forecast of increase wagon loadings must be put into practice in co-operation with the ministries of energy, mines and industrial development so that there is speedy movement of coal cement and steel.

Economic Survey: The Annual Economic Survey of the Union government is the occasion to look at the economy and its performance during the year (1974-75) As on other occasions (see Vol IV pp 266-268), the basic document is the Minister of Finance's Economic Survey, alongside of which the NCAER review of the year, the RBI Survey of household indebtedness, the World Bank Atlas for 1974 *and* the Bombay Round Table's conclusions, which appear as the third article in this issue, should be considered. The Economic Survey characterises 1974-75 as the year of major challenges and is cautiously optimistic about its rather poor *industrial and agricultural performance*. NCEAR is a little more optimistic about this year's performance and the future outlook if inflation is continued. The Bombay Round Table quite bluntly characterises this year as one where inflation and stagnation *co-existed*, the two reinforcing each other, the way out being increased production of wage goods and employment. The RBI survey covering the period July 1970-July 1971 concludes that 46 percent of the salaried classes were in debt to a total of Rs. 249 crores, on an average of Rs. 1,585 per household, 83 percent of the total outstanding debt was incurred by households in the monthly expenditure range of Rs. 101-750, 39 percent for housing construction followed by marriage, trade, industry and agriculture, with over half paying an interest of 3-9 percent. For 1973-75 the years of inflation, it can be concluded that the impact of indebtedness must have been even more serious. The World Bank Atlas reports that during 1965-72 India's GNP grew at 1.4 percent per annum, while the population grew at 2.3 percent, which is part of the developing Countries record of population growth continuing to undermine economic growth. India is one of 35 developing countries with a per capita income below $200, China was $170, the Socialist countries $480 and the industrial countries $3,670. The Atlas warns that these figures tell little of the absolute poverty in the developing countries and the distribution of poverty within the country. Second all the documents-

the Economic Survey, the NCAER and the Bombay Round Table—refer to the fall in the index number of wholesale prices since September 1974 as good and expect that this decline in prices will continue. Third while the Economic Survey expects that the 1974-75 agricultural production will be the same as that in 1973-74 at 107 million tonnes, which was 7 million tonnes short of the requirements, NCAER forecasts an output of 110 million tonnes and the Bombay Round Table urges more intensive effort in coarse grains, pulses and oil seeds and in contingency planning. Fourth all documents refer to the disap-pointing industrial performance which was 3.4 percent in the Fourth Plan (against the target of 8 to 10 percent), 0.7 percent in 1973, 2.5 percent in 1974 and 3.5 percent in 1974-75(against 0.5 percent in 1973-74).While coal, cement, steel, textiles are individually doing well, the long term performance of the sector will depend on the trend of public investment, points out the survey, a rational system of prices according to the NCAER, and moving from a regulatory to a developmental approach, according to the Bombay Round Table. Fifth the encouraging expansion of exports (by 36.2 percent) is outplaced by the increase in imports (54 percent), and both the survey and NCAER drew the conclusion that this means that the need for foreign aid is increased. The Bombay Round Table emphasizes the need to expand non-traditional exports and cut back on imports as a means of meeting this situation. Sixth all documents stress the importance of augmenting the rate of savings, particularly of the public sector and diverting them more to the high priority investments in both the public and private sectors. The outlook is a difficult one. There is the 20 years secular trend of 3-3.5 percent growth in the economy. The national environment has many pitfalls-inflation, stagnation, and population growth: the international environment is equally uncertain. The break through for the economy will come when agricultural production moves forward strongly.

Fifth Plan: By the end of February, the Second Annual Plan for 21 States were finalised, involving an increase of Rs. 450 crores over the First Annual Plans. The largest increase has been for Maharashtra—Rs. 75 crores—mainly for its employment guarantee scheme, Madhya Pradesh-Rs. 63 crores—for its irrigation plan, Punjab—Rs. 56 crores—for increased food production, Tamil Nadu, Andhra Pradesh, West Bengal, Rajasthan and Gujarat ranging from Rs. 23 to 33 crores and Haryana, Bihar, Orissa and Kerala ranging from Rs. 11 crores to Rs. 18 crores. As the Union government's assistance to the State Plans has been pegged at the 1974-75 level, this means additional tax mobilisation by the States of Rs. 450 crores. As of the end of February, before the Union budget presentation, those States which have presented their annual budgets to the legislature have large uncovered deficits in the hope that there will be increased Union assistance. Punjab shows an uncovered deficit of Rs. 6.83 crores, Haryana Rs. 17 crores, Karnataka Rs. 17.42 crores, Kashmir Rs. 40 crores, Andhra Pradesh Rs. 20.34 crores and Madhya Predesh Rs. 20.18 crores. Similarly the plans of the Union Ministries have been finalised and the total Plan outlay set forth in the budget.

Prices and anti-inflation: The index number of wholesale prices continued its decline in January, standing at 313 for the week ending February 1, which was a fall of 0.3 percent compared to the 314.7 for the week ending January 25 and a decline of 0.5 percent compared to the prices a month earlier, but 14.74 percent higher compared to the prices a year ago.For the week ending February 1, food articles declined by 0.3 percent over the week, fruits increased by 1.2 percent, oils decreased by 2.5 percent,

sugar increased by 1.8 percent, liquor and tobacco declined by 1.0 percent and industrial raw materials by 0.9 percent. This declining price trend was due to continuing anti - inflationary measures. Money supply with the public increased at a low rate by Rs. 337 crores (3.1 percent) between April 1974 and January 31, 1975 compared to Rs. 960 crores (10.2 percent) in the corresponding period of the previous year. During the current busy season upto January 31, 1975, the increase in gross bank credit including bills rediscounted with the Reserve Bank was Rs. 497 crores, compared to the Rs. 675 crores during the same period of the previous year. Differential interest rates on deposits to help banks with deposits below Rs. 25 crores have been once more authorized by RBI. Some of the normal RBI actions in February also helped. It laid down maximum limits (Rs. 5,000 or 5 percent of the total time and demand liabilities between Rs. 1 lakh and Rs. 200 lakhs) on the total advance of a primary co-operative bank and similar overall limits on unsecured advances of these banks. It called attention to the large (17.6 percent) instalment over dues by the State Finance Corporation which should be reduced, their poor record in follow up and supervision of sanctioned loans and the slow pace in processing IDA credits which averages about 50 percent of what it should be. Also the RBI reports a rapid growth in rural bank branches as one means of increasing deposits and savings. Between nationalisation (June 1969) and December 31, 1974, the 14 nationalised banks opened 9,918 branches, 48.4 percent in rural areas. Out of a total of 18,180 branches, 6,631 are in rural areas, reducing the average population served from 65,000 in June 1969 to 33,000 in December 1973 to 30,000 in December 1974, the major new centres being in Assam, Bihar, Nagaland and Orissa. On the production side, there are expectations of a good rabi harvest as will be noted later, individual production has increased by 4 percent during the first 9 months of 1974-75 and the public sector output by 12.5 percent during the period. For ensuring that the pattern of consumption for the poor is improved, this trend to lower prices must reach into retail and rural prices.

National Production Front.

Public Sector Performance : The January production of the 15 public sector units under the union Ministry of Industry was Rs. 52 crores, against the target of Rs. 53 crores. For the ten month period April 1974-January 1975, the cumulative production of the units was Rs. 412 crores against the target of Rs. 446 crores, and is likely to surpass the year's target of Rs. 566 crores. The increased production came from every unit, even the sick ones—MAMC achieved 75 percent of the target in January, HEC 84 percent. Over the year, however, the Heavy Machine Building plant has operated at 40 percent capacity the structural Fabrication. Shop a low 25 percent, the Foundry 33 percent, and the Forge shop 40 percent. But these statistics must be set off against its outstanding expertise in design and heavy engineering, its high quality products and its wide ranging supply of steel plants machinery. It must cut back on its serious declining delays through better co-ordination of its various shops. There is need for a moratorium on the annual interest on its huge debt of Rs. 211 crores to the government, the price of the equipment it is supplying to Bokaro should be fixed at a realisticalised and the 1975 to 76 plan allocations to Bokaro and Bhilai be adequate. The best performance was BHEL which is surpassing its target and HMT which produced 96 percent of its January target. These undimensional statistical records must also be checked against their capacity use and cost factor which will be known at the end of the year

Steel : World Steel output in 1974 rose only by 2.6 percent to 683 million tonnes (compared to the 10.6 percent increase in 1973) with USSR at the top (136 million tonnes), followed by U. S. (132 million tonnes) and Japan (117 million tonnes). Comparatively the Indian steel supply between April 1974 and January 1975 including imports and production from arc furnaces was a modest 5.53 million tonnes, representing a 23 percent increase over the previous year's 10 months. For the year, the total production will be 6.7 million tonnes. Durgapur was doing well 105 percent in the steel making shops, and is likely to make a profit for the first time. Bhilai is also producing to capacity, and its expansion from 2.5 million tonnes to 4 million tonnes though slowed down due to financial constraints is continuing. Bokaro's blast furnace set a record production in January and the biggest Universal slabbing mill in Asia was commissioned in December 1974. TISCO continued its marginally lower production of saleable steel in January. Taking the integrated steel plants together, their first ten months production was up by 3,30,000 tonnes (17 percent) compared to the same period last year, the total despatches from the steel plants to stock yards increased by 5 lakh tonnes, with the stock yards which were expanded by 18 new base points being the major distribution centres. This had decreased the misuse of steel and had also reduced inventories and cut back on inflated indents from 16 million tonnes per annum to 8 million tonnes, which can be reduced still further. Due to less government spending on construction and budget constraints on railways and State Electricity Boards, there is a glut in the case of bars, rods, coils and structural steels. The railways have reduced their Steel Sections orders. To meet this situation what SAIL must do first is to change the product mix of the plants from thicker rounds to larger production of plates and heavy structurals for which there is a growing domestic and international demand. On this basis a second action will be to export the additional production, noting that the international steel market is facing a surplus as seen from the declining production in 1974. A third action is to continue reducing the stocks which were 3,96,000 tonnes in May 1974 down to 2,98,000 tonnes in January and this should be further reduced by another 20,000 to 30,000 tonnes. Finally imports should be reduced from 9,00,000 tonnes this year to 6,00,000 tonnes next year which is possible if the product mix of our plants meet our needs for sophisticated item.

Crude : February saw intensification of indigenous crude production, particularly off shore as well as negotiations for imports. For 1975-76, 2.8 million tonnes of crude are to be imported from Iraq—the same as for the previous year. In addition to the 1.1 million tonnes to be imported from Saudi Arabia, negotiations are underway to import an additional 5 million tonnes over a 3 year period. Part of the imported crude is processed by the foreign companies at a cost of Rs. 20 per tonne, which can be avoided if the public sector refineries, Haldia, Koyali and Barauni function to capacity. There was some fall in IOC profits in 1973-1974 which cannot be explained by cost, interest rates and depreciation increased. In this connection the Krishnaswamy committee report (see Vol IV p 536) now under study by the government recommends dropping the principle of import of indigenous crude prices and raising them marginally. The fuel oil surplus referred to in the last issue (p 144) running at 4 million tonnes might call not only for a new distribution policy but save lowering of price. Offshore explanation is being intensified in all Parts of the Country. In Kutch and Bengal basins, the 2 U. S. Companies

have located promising oil structures and can commence operation after the monsoons in October. In Bombay High, the fourth well will be drilled and ENI, an Italian company, will be helping setting up structurals of the various wells and positioning drill ships, two of which are being bought from a U. S. Company. If the next 3 wells in Bombay High are as prolific as the first 3, ONGC will need 10 ships in this area alone. This will reduce our dependence on imports and may make the takeover of Shell and Caltex at a high cost less urgent, because by their contracts they are obliged to refine indigenous crude after 1977 and be paid simply a refining fee. ONGC is also readying itself to conduct oil exploration in the cauvery off shore basin—Madras to Kanyakumari—from July and has purchased a seismic ship, Anveshak, which is equipped with computerised navigation devices guided by signals from the U. S. communication satellite, COMSTAT. A U. S. firm will be in charge of operations, probably Asamera of Calgherry. In any case this expansion of indigenous production is necessary because the major OPEC producers are cutting back on their production to conserve their future supplies. Last year, Liby reduced its production by 30 percent, Kuwait by 15.7 percent, Algeria 7. 0 percent, Ecuador 13.8 percent, Qatar 9.1 per cent and Venezuela 11.6 percent.

Coal: The coal situation presents in January the same ambivalent situation—increased production and non availability for industry—as reported in the last issue (p 146). On the one hand, the minister of Energy reports that the January production of 8.7 million tonnes increased the December record by 1 million tonnes, the cumulative production for the first 10 months of the year being 71.75 million tonnes, with the certainity that the 88 million tonnes target will be exceeded. Within this total production, CMA's production in January went upto 5.76 million tonnes, the 10 month cumulative production being 49.3 million tonnes against last year's 10 month of 43.7 million tonnes, leading to the certainity that its target of 61 million tonnes for the year, will be attained. The Minister claims that power houses have all the coal they need, steel plants have 7 days stock, cement plants 24 days, with a record railway loading in January. On the other hand textile mills have had to close down some of their shifts because of the lack of steam coal. CMA tells the railways that it is short of steam coal and asks that it go to the Central Indian mines for it. This upsets the railway time table. Also cement and newsprint industries complain of lack of wagons. All this is a different story from that presented by the Union minister of railways in presenting his budget and that of the Energy Minister. The need for an integrated attack on coal movement and coal price is once more reiterated.

Khetri: Hindustan Copper's Khetri, Rs. 117 crores, copper complex with a production capacity of 31,000 tonnes of copper per year was commissioned in February. The ore from Khetri and Kolihan are mixed and sent to the concentrator plant for production of 12 percent and above copper from there to the flash furnace of the smelter plant for the production of 50-60 percent copper. Also the sulphuric acid plant and the triple super phosphate fertiliser plant will go into production soon. The complex has an R&D programme in geology, mining, mettallurgical and fertiliser plants and should improve further the doubling of copper production from 1.5 lakh tonnes to 3.1 lakh tonnes in the last 2 years and save the Rs. 75 crores which are now expended in imports.

Iron Ore: With the world's largest iron ore deposits of 21,478 million tonnes, the

Iron Ore Board study released in February shows poor mining practices and techniques in use. Captive mines are over exploited and rich private sector ones neglected. Also the study shows that the actual exploitation is on an ad hoc basis, not being based on the nature of deposits in different mines, or the needs of exports and steel plants. Also selective mining leads to premature exhaustion of the required iron ore grade, with lump ore being crushed to fines, while fines lie unused. Private owners in the Bellary-Hospet area mine the most easily available ore—the float ore and then complain of the high quantity of waste. The Iron Ore Board in light of this study must lay down rules for rational mining by the private sector.

Sugar and bagasse : Sugar production for 1974-75 is estimated by ISMA at 44 lakh tonnes, compared to 39.49 lakh tonnes in 1973-74 and 38.73 lakh tonnes in 1972-73. The agricultural Prices commission (APC) warns that with an 11 percent Increase in sugar cane acreage in 1973-74, cane crushing increased only by 5 percent and that this should not happen this year. To prevent it, APC does not recommend a big increase in sugarcane price for the 1975-76 season as that will add to the inflation : it does recommend a small increase from 8.50 to Rs. 9.50 a quintal with a basic recovery of 8.5 percent, subject to the usual proportional premium for every 0.1 percent recovery increase. But to increase sugar production, and to ensure a steady flow of cane to these factories. it recommends (a) minimising the differential levy advantage of the Khandasari units, (b) a levy on the Khandasari units and an increase in their excise (c) a rebate on the excise duty for excess sugar production and (d) allowing the industry a share in the profits from additional sugar exports. In fact the industry is urging the government, which has upto mid February exported 4 lakh tonnes, to export 12 lakh tonnes and so earn about Rs. 1,000 in foreign exchange. There is need for early action on the APC recommendation. A committee of the Paper and Pulp Development Council which investigated the possibility of using bagasse for making paper concludes that there is little chance of this being a major raw material for paper because of the 60 million tonnes of cane crushed which produce 20 million tonnes of bagasse, only half is dry and can be used for making paper, if sugar mills convert their bagasse fixed boilers into coal or oil fired boilers. Few mills are willing to make this conversion and this will have to be planned and provided. At the same time, the quantity of bagasse is declining with the new varieties of cane. On the whole bagasse performs a useful function as an energy source for the sugar and other local industries and should continue as such.

Urbanisation : An expert group called by the Union ministry of works and housing in late January recommended a multi-pronged drive to regulate land use in urban areas and ensure orderly growth of towns and cities. The major elements of the proposed programme include : (a) a spatial pattern of economic development and location of a hierarchy of human settlements consistent with the exploitation of the natural and human resources of the region, ensuring functional linkages : (b) optimum population distribution between rural and urban settlements and among the towns : (c) to achieve maximum economic growth, distributing economic activities in small and medium towns and growth centres : (d) control and stopping the further growth of metropolitan cities through legislation and new counter magnets : and (e) providing minimum infrastructures in rural areas to reduce the difference between rural and urben areas. By 2000 A.D., the urban population of the Country, will be

30 percent and this high proportion could be an instrument of growth and progress. To prevent concentration of land, in addition to ceiling legislation, urban development banks are recommended as noted in the last issue p 139, to make loans to local bodies for civic amenities. Particular attention should also be given to urban poor to counter the elitist-orientation to urban planning.

Agriculture : The Union Agriculture ministry reports that as at February 21, rice procurement crossed the 25 lakh tonne mark, with 3 States having improved their previous year's performance : Tamil Nadu at 2.51 lakh tonnes (1.13 lakh tonnes last year), Andhra Pradesh 4.48 lakh tonnes (4 lakh tonnes last year) and West Bengal 1.37 lakh tonnes (1.06 lakh tonnes last year). Punjab's 8.08 lakh tonnes was the same as last year. Andhra Pradesh's rabi rice crop is coming out well and is estimated at an additional 10 lakh tonnes, making possible a procurement of that order. Special fertiliser assistance is being given to Andhra Pradesh, Punjab and Haryana to take advantage of their good rabi production. In this connection the Union ministry of agriculture also point out that atleast 20 percent of the fertilisers fatten the weeds and, at a time when there is a gap of 10 lakh tonnes compared to fertiliser demand and above half of the 35 lakh tonnes supply has to be imported, this wasteful consumption of fertilisers by weeds of which new varieties are daily sprouting must be stopped. This means that manual weed control must be replaced by chemical weed control, and State governments are running demonstrations to bring 4 5 million hectares under the weed control programme, involving the co-operation of irrigation and fisheries departments particularly in the matter of acquatic weeds. Another programme launched in February was the Rs. 240 crores national seeds project operated by the State governments and agricultural universities under the direction of the Natural Seeds Corporation and State level seed corporations-particularly in the southern states where 85 percent of total seeds production takes place. The World Bank is financing half the cost, providing heavy machinery for land levelling and seed processing plants with a 20,000 million tonnes capacity. On the overall wheat situation for the year, the 1974-75 rabi crop estimate is 26 million tonnes, compared to 22.07 million tonnes last year, 24.73 million tonnes in 1972-73 and 26.41 million tonnes in 1971-72. The government had not as at February end decided on its rabi procurement policy and this should be done in light of its statement that the reliance on wholesalers last year has failed. Punjab reports a rich rabi crop at 60 lakh tonnes of wheat. Coarse grains will be 2.80 lakh tonnes and oil seeds 1.60 lakh tonnes. The long term trends are a little disturbing with a decline of food grains acreage and declining off-take of fertilisers. To counter this the government is arranging specially for the supply of power to the farmers and providing special facilities for some 60,000 farmers in 12,000 villages. Himachal Pradesh started poorly but has picked up with late rabi sowing. Bihar's late rains have made it set a 10.3 lakh tonnes wheat target. The 4 rounds of winter rains in U.P. may result in its exceeding the rabi larget of 134.5 lakh tonnes, wheat at 88 lakh tonnes. By the end of February the government purchased 1. 1 million tonnes of wheat in the U. S. on commercial terms. The public distribution system should be able to scrape through with the internal production and foreign purchases which now amount to 6 million tonnes.

Exports : The Country's foreign trade presents the same bright and disturbing

picture outlined in the last issue (p. 148). Exports on all items registered a very good increase at 35 percent. Imports, however, registered an even higher increase of over 54 percent. The trade deficit for the nine months of 1974-75 is Rs. 585 crores, which is double that of the whole of 1973-74. For this year the trade deficit may be Rs. 900-1,000 crores. The disturbing elements in this picture are : (a) the high cost of petroleum products, fertilisers, food and non - ferous metals imports : (b) the 20 percent devaluation of the Rupee between December 1974 and January 1975 because of the depreciation of the Pound sterling against Deutsch marke, French Swiss and Belgian Francs which has meant that our capital goods imports which have increased in value by 10-15 percent because world inflation is even more costly due to the de facto Rupee devaluation. This helps exports which in value terms may reach Rs. 3,000 to Rs. 3,100 crores. But in terms of marks and francs, the foreign exchange earned will be smaller : (c) the fears of world recession may make the deficit larger in 1975-76 through the fall in exports - particularly in jute where U. S. has cut back jute backing imports from 15,000 tonnes a month to 2,000, our cotton textiles which are 30 to 40 percent higher in prices than Pakistan, leather goods whose demand is shrinking, chemicals and allied products whose unit price in the international market is falling, cashew exports which are declining, marine products catch which is growing smaller, and the falling demand for steel based items. On the other hand high sales of sugar, cement, coal and steel may just about offset these decreases and hold next year's target to that of this year's achievement—Rs. 3,100 crores. The positive trends include a series of encouraging bilateral trade agreements including a four fold increase in Indo-Yugoslav trade from Rs. 19.8 crores under the Rupee trade arrangement in 1972-73, to Rs. 80 crores under the free currency arrangement this year including exports of tea, hides and skins, groundnuts, coir, pepper, rubber tyres, engineering goods and imports of ships, tractors and capital goods, an agreement to export Rs. 7 crores of mica to the Soviet Union, negotiations to use EEC's GSP for a three year period, to do away with sub ceilings as much as possible and improve India's unfavourable trade balance through further imports into EEC countries of tobacco, leather goods, marine products and engineering goods—in all of which the visit of the EEC delegation in February and travel to our main trade centres was helpful. Engineering exports are doing so well that it will surpass its target of Rs. 250 crores and will go into Rs. 300 crores next year. It is capital goods and labour intensive items which are doing well, while the steel based exports face a falling market as noted earlier. Sugar exports are likely to touch Rs. 700 crores, if arrangements to export 10 lakh tonnes are successful (compared to last year's Rs. 270 crores). Similarly the glut in bitumen is ending with large exports to Indonesia and Iran, processed rose wood exports are expanding and going beyond this year's 15 million tonnes of iron ore export, contracts for next year are being negotiated for 17.7 million tonnes, cotton textile exports in the first eight months, April-November, earned Rs. 225.69 crores exceeding the year's target of Rs. 225 crores and will be Rs. 307 crores for the year — the major part of the export being cotton piece goods and garments. The Indian Engineering Trade Fair which opened on February 10 has already attracted Rs. 1.5 crores of orders. Iron and steel exports in December stand at 99,000 tonnes (Rs. 9 crores) and will be 213 lakhs tonnes (Rs. 23.4 crores) for the year. The number of foreign collaborations approved in the first 9 months, January - September 1974 was 286 compared to 265 in all of 1973, making the total foreign collaboration at September 1974, 4,244, of which

1,042 were U. K., 800 U. S., 701 West Germany, 405 Japan, 215 Switzerland, 183 France and 118 Italy. The largest collaboration is in industrial machinery, followed by electrical equipment, machine tools and chemical products. This is an area which demands close scrutiny, as it holds back development of indigenous technology.

Aid: In February Japan signed an agreement with India (a) to reschedule debts from India to the extent of Rs. 32.9 crores, (b) Rs. 19 crores for the purchase of steel, chemicals, machinery and fertilisers and (c) to make good the short fall in the foreign exchange costs of the 3 fertiliser plants at Bhatinda, Ranipet and Mathura each having an annual capacity of 2.25 lakh tonnes of nitrogen, in collaboration with Toyo Engineering and on which Japan had not made a decision. France extended a fresh credit of Rs. 57.60 crores for 1975-76, which is 15 percent more than its aid of Rs. 50.27 crores for 1974-75. This comprises Rs. 21.10 crores for projects, Rs. 20,18 crores for non-project needs, Rs. 16.52 crores for special projects and Rs. 16.52 crores for the space programme. The IDA loans of $ 100 million for industrial imports, $ 45 million for the Godavary barrage referred to in the last issue (p. 149) were signed. In addition the World Bank has given a loan of $ 109 million for the Phulpur fertiliser project in the co-operative sector.

International

Bangla Desh: Bangla Desh like India ended the second half of 1974 with a large trade deficit. Its exports earned taka 148 crores and imports cost taka 355 crores. The major export was jute and jute products, which brought in 125 crores, 35 crores less than the income of the first six months. In fact the government reports a fall in jute goods production by 3.5 percent to 1.3 lakh tonnes during July-September 1974, with rather gloomy prospects for extending jute cultivation, in view of the rising price of paddy and rice. There was some increase in the exports of fish, hides and skins and paper. With India, Bangla Desh has agreed to export Rs. 3.5 crores of fish in 1975 payable in free foreign exchange. Also during February, discussions between the two countries paved the way for effective use of the Indian credit of Rs.10 crores, more speedy exchange of jute and coal between the 2 countries, and agreed on the principles for the delimitation of their maritional boundaries. February also saw continuation of India-Bangla Desh discussions on allocation of waters to meet the needs of Farakka and Bangla Desh, which should soon result in an agreement.

Pakistan: As noted in the last issue, a contract for the import within 6 months of 2 lakh bales of raw cotton, valued at Rs. 25 crores from Pakistan was signed at the end of January in Bombay by representatives of the Cotton Corporation of India and the Cotton Export Corporation of Pakistan. Since 1965, this is the first trade contact between the 2 countries. The government had reduced the duty on this import to the extent of Rs. 6.75 crores and has given 1.50 lakh bales of the import to private mills which had exported at least 5 percent of their packed production in 1974, 30,000 bales to the National Textile Corporation mills and 20,000 to co-operative units, the last 2 on a spindle shift basis. From the middle of February, all restrictions on the operatien of shipping services between the 2 countries were withdrawn in accordance with the January 15 agreement signed between the 2 countries (see last issue p. 149).

World Monetary Reform: February did not record any development in the world monetary reform area except on two

matters. Both the U.S. dollar and the U.K. pound sterling continued to weaken. In fact because of OPEC decision to express oil prices in non - dollar currencies, the dollar fell to 2.3 marks, the lowest since July 1973. Second the EEC central banks have made a proposal to their ministers, which will be discussed at the ministerial meeting on March 18, to use gold for international payments without increasing its stock. The proposal is that for an initial 2 year period, central banks should be allowed to buy and sell gold among themselves and on the free market, provided the free market price is high and the net stock of gold among the participants does not increase. Transfers of gold between them are to count in calculating whether gold stocks have risen and the system will be revised if there is a sharp drop in the price of gold. This is a proposal that concerns the rich countries and even for them, there are unanswered questions : as to how multi lateral operations can be financed by gold transfers without increasing net holdings, whether selling gold must be simultaneous with buying etc.

Emergency Aid : In early February at a pledging conference for the emergency aid for the 32 most seriously affected countries, EEC pledged $ 500 million, of which $ 150 million had been released in October, $ 100 million in January plus $ 42 million in food aid. The balance is to be contributed in bilateral or multi lateral aid. U.S. announced an increased food aid of $ 1.6 billion, which would provide 4 million tonnes of food grains to 31 of the 32 most seriously affected countries, Britain and France announced $ 200 million each, Japan announced having disbursed $ 170 million. Now this fund will be merged with the U.N. special fund for the most seriously affected countries which starts in April. In January, the Secretary General allocated $ 100 million from the Emergency food (which is all that he had) in addition to the $ 34.9 million already allocated. A meeting of U.N., FAO, IMF, UNCTAD, UNDP & the World Bank took into account the size of prospective deficits due to rise in import costs, per capita income, level of foreign exchange reserves, external debt and importance of foreign trade in making this allocations — the larger ones being Bangla Desh $ 32.5 million, India $ 32.5 million, Sri Lanka $ 7 million and Pakistan $ 7 million.

New international Economic Order :

Further to the UN programme of the New International Economic Order reported in Vol IV p 362 and the last issue p 152 four inter- governmental meetings took place in February in preparation of the programme. Discontent and frustration of the Third World countries with the results of the First Development Decade the poor start of the Second Decade and non-application of the International Development Strategy attached to it, the lack of result of 3 UNCTAD conferences and ending in the oil crisis have been accompanied by a series of international conferences on environment (Stockholm Vol II No. 7 pp 15 to 18) raw materials (New York Vol IV p 362) population (Bucharest Vol IV p 591), Food (Rome Vol V p 16) and Ocean resources (Vol IV p 592) and the declaration of the New International Economic Order and the concept of Collective Economic Security which are to be turned into a programme by the special session of the U. N. General Assembly from 1-12 September. A series of U. N. preparatory inter-government meetings in March and June for this important event are to take place. In February there was a meeting of the non-aligned countries in Dakar which decided that (a) the discussion and dialogue with the rich nation should cover all raw materials as well as oil, (b) the developing countries have a

right to control their natural resources (c) an action programme should be followed by the delegates from the third world selected by the third world in bargaining with the rich countries, and (d) a group of 18 representatives, six each from Asia, Africa and Latin America will finalise the modalities of financing the operations of a Special Fund for creating a buffer stock of raw materials produced in developing countries and to be financed by them including the oil producing nations. A second meeting of 104 under developed countries in mid February in Algiers in preparation for the Fourth Conference of UNIDO in Peru established an action programme aimed at increasing the 7 percent of the world's industrial output of the underdeveloped countries having 70 percent of the world's population to 25 percent of the world industrial production by 2000 AD. For this it was decided that (a) each under developed country should aim at an annual growth rate of 8 percent, (b) each such country had the right to nationalise foreign industries and investments, (c) the developing countries should strengthen producers associations, (d) a neutral fund for industrialisation should be created, (e) developed countries should import more from developing countries and (f) multinational corporations should be subject to regualation and control by both the home and host countries. All this is far away from the triage life boat theories circulating in the developed countries under which poor countries like India and Bangla Desh that depend on world food supplies are to be left to die off. A third meeting of OPEC Countries in Vienna in February established a charter for a New International Economic Order with a new set of concepts for meeting the problems faced by producers and consumers. A fourth meeting was in Paris of the International Energy Agency (comprising the OECD countries) which established goals for reducing consumption of petroleum under which oil imports will be cut by 2 million barrels a day by the end of the year (100 million tonnes per annum) and to intensify the development of substitute energy sources.

OPEC Reserves: IMF reports in February that OPEC reserves in the Fund at the end of 1974 was 36,000 million SDRs compared to 2,100 million SDRs in 1973, with Saudi Arabia leading (11,700 SDRs) followed by Iran (6,850 SDRs) and Venezuela, Nigeria etc. The U.S. treasury reports that between January and December 1974, the OPEC Countries had accumulated $ 60,000 million in surples revenues, 35 percent of which went into European currency markets, 18.5 percent into U.S., 12.5 percent into U.K., 9 percent into IMF and IBRD and only four percent into developing countries. As a result OPEC and European countries have contributed $ 3 billions towards the $ 6 billion IMF petro-dollar recycling facilitiy referred to in the last issue p. 151 The U.S. alone received $ 11,000 million in OPEC investment last year. This strengthens the New International Economic Order Project for an international investment agency which can direct investment to developing countries' projects.

World Stock Piles, Foodgrains and Inflation : With a view to stabilise prices and ensure supplies, UNCTAD has established a plan for creating international buffer stocks in 11 commodities, for which a fund of $ 10,700 million would be needed and which oil producing countries could finance, as noted earlier. They would involve 18-36 million tonnes of wheat, rice and coarse grains (against the FAO estimate of 40-60 million tonnes sugar 2.7 million to 5.5 million tonnes, cotton 5,35,000 to 1 million tonnes, coffee 7.5 million to 15 million tonnes, cocoa 1,50,000 to 3,00,000 tonnes, tea 89,000 to 1,78,000 tonnes and similar quantities of

rubber, jute, steel, copper, tin, bauxite alumina and iron ore. The critical period in commodity trade will be in the years after 1975, when the boom years give place to inflation, stagnation and recession, with their deletarious effects on the developing countries. Hence the other parts of the UNCTAD Plan envisage multi lateral commitments for purchase and sale of the commodities, compensatory financing of export earnings and the processing of primary products. The plan was approved by the UNCTAD Special Committee Meeting in February. On the food grains front, the U.S. food grains position in 1974 is smaller except in regard to wheat. The stocks of maize, sorghum, oats, barley and soyabeans were higher in 1973 than in 1974. Argentina's stocks for 1974 were higher in 1973. The overall grains exports are estimated for this season at 10-11 million tonnes. In the long run the food grains supply and stock will depend on the extent to which developing countries switch their investments to agriculture and bring about real land reform and an egalitarian society and the extent to which the rich countries are prepared to set aside food grains for use by the World Food Council. All these prognosis depend in part on future inflation trends, which are not very encouraging. In 1974 Germany alone managed to keep inflation down to 7 percent. Japan recorded 24.4 percent inflation, U.S. 12.2 percent, Canada 12.4 percent, France 15.2 percent, Italy 24. 5 percent and U. K. 19.1 percent. Towards the end of the year — December 1974, the price rise in these countries (24 OECD ones) was around 1 percent. If this countinues then 1975 can see some easing of industrial raw materials prices and stabilisation of world market prices.

Gatt : The delayed GATT talks opened again on February 11 with the U. S., Canada, the 9 nation EEC, Japan and 60 developing nations participating in the negotiations to free the flow of world trade from the tariff and non tariff restrictions that now hamper trade. The talks are starting against fears of world recession, so that each country is more concerned with safeguarding its production rather than opening up for trade. With U. S. trade bill finally approved by its Congress, the Tokyo Round as it is called will decide on a time table and agenda for a new round of full scale negotiations later in Tokyo.

Asian Economy : The Economic and Social Survey of Asia and the Pacific 1974 issued by ESCAP for its meeting in March in New Delhi is a mid term review of the International Development Strategy for the Asian region. It paints a grim picture of unrelieved poverty for hundreds of millions non achievement of Second Decade targets, food crisis, resulting in the future in the death of millions of people unless there are fundamental changes in government strategies in the region. These new strategies must concentrate on the poor majority, and provide for local and decentralized efforts and people's participation. The major issues facing the Asian countries are food shortages and policies to deal with them: energy and raw materials problems; employment and man power development; external trade and the problems of land locked and island economies. The modest targets of 6 percent GNP, 3.5 percent per capita growth, and 4 percent agriculture have not been reached, with negative agricultural growth in some countries. By mid 1974, 73 percent of the population of all developing countries, i.e., 2,074 million are living in this region, and by 2000 AD, 1,500 million (60 percent) will be added to the population. The traditional develepment models and strategies cannot meet this situation and there is need for new approaches which

include: the basic goal of planning to be to raise the living levels of the bottom 40 percent, recording consumption and production priorities to restructure trade and emphasise local technology, a heavy increase in agricultural and rural communities to raise productivity and expand employment, along with integrated public works, land distribution, product diversification and agro-industries promotion programmes. This process has to be essentially national and must begin immediately. This is an approriate prolegomena to the New International Economic Order.

II Agriculture

Paddy : The Thaladi and Samba paddy prospects are not very bright. The lack of water even in Tiruchi and Thanjavur disticts has had adverse effects on the crop and in some areas such as Lalgudi the crops have withered to a point where the farmers have allowed the cattle to graze the Thaladi crop. The government which closed the drawal of water from the Mettur reservoir on February 8, in the hope of saving some part of the Thaladi crop--at least that over 3 lakh acres—released the Mettur waters on February 23—which had sunk to six meters—so that it reached the Grand Anicut on February 26 and fed all the river systems in the delta by turns for a week. The effects on the crop will be known in a month's time. There is no doubt that a 30 percent reduction in the paddy harvest will be the result of the drought and the short fall in paddy production this year will be a minimum 20 lakh tonnes. This also means that the government will have to revise the orders for levy procurement (see Vol IV pp 635-636 and vol V pp 17-18). The levy will have to be on the basis of the actual yield obtained by the farmer. Another problem facing both the government and the FCI is the wide gap between levy prices and the open market prices to the point where the 40 FCI purchase centres in Thanjavur district were idle in February, since no farmer wished to sell his produce at the levy price. In fact the FCI also faces other administrative constraints. It has four modern rice mills (3 in Thanjavur district and one in South Arcot) and each needs 1,500 tonnes of paddy a day. Hence both the Civil Supplies Corporation and FCI wil have to resort to open market purchases to procure the maximum in this year of shortages. In early February, paddy prices began declining in Thanjavur by 10 to 15 paise per kg in the retail market and Rs. 5-6 per bag of 57 kgs. With the harvest reaching its peak in early March, there could be a small reduction in the high prices all over the State. But this would depend on the extent to which the Union pool can spare rice for the needs of this State, which are computed at 50,000 to 1 lakh tonnes per month until October.

Cropping pattern and Intensity in Thanjavur : The October 1974 issues of the Agricultural Situation in India draws attention to some feartures of the cropping pattern and cropping intensity of various size classes of farmers in Thanjavur district over the periods 1962-63 and 1968-71 as part of a study of some IADP districts. First there was no change in the percentage under food grains during this period in Thanjavur. Second the proportionate area under Samba declined from 49 percent in 1962-65 to 36 percent in 1968-71, while that under pulses and other food grains increased from 3 to 11 percent. Third this change into double cropped area is a response to canal irrigation and is agro-climate specific. Fourth in medium and large holdings there has been a shift from the long duration Samba to Kuruvai and Thaladi. Fifth the cropping intensity was high in the prices and costs of inputs. Finally the cropping intensty was high in the years 1962-65 compared to other IADP districts, but took second place in 1968-71. Per hectare expenditure on net cultivated area was highest among medium farmers, and the reduction in fallows during the rabi season made for increase in cropping intensity.

Productivity Levels in Drought Prone areas : The August 1974 issue of the Agricultural Situation analyses the productivity levels of the major crops in the Drought Prone Areas Programme which are classified into four groups according to their average rainfall—as arid with less than 375 m. m, Semi-arid 375 to 750 m.m, dry sub humid 750 to 1,125 m.m and humid above 1,125 mm. In this State, Ramanathapuram and Dharmapuri fall under the dry sub humid category, and as in other DPAP areas the productivity levels of different crops are subject to temporal fluctuations due to low precipitation, erratic distribution, high run off and other ecological imbalances. The study shows that Ramanathapuram's yield in bajra and groundnut was above all India levels by more than 20 percent between 1965-66 and 1969-70 and at 10 to 20 percent above for cotton. Similarly Dharmapuri's yield of rice, jowar and bajra was more than 20 percent above the All India level during the same year, and between 10 to 20 percent above in the case of ragi. From the study, the conclusion is drawn that low productivity in these districts in years of drought is not a reason for their moving out of crop husbandry and that their productivity can be increased if a suitable crop strategy is developed, in accordance with the behaviour of the rainfall and a continous flow between the research stations and the farmers is assured.

Research Results : One of the varieties of paddy IR-26 (see Vol IV p 593) recently released with the reputation to be resistant to the brown hopper pest has not proved to be so. In the neighbouring State, Kerala, this variety has beem extensively attacked by the pest. New varieties developed from Bangla Desh strains are resistent to the brown hopper disease and are being released. In relation to the problem of weeds being fed by our scarce fertilisers, a new pesticide NRDC-143 developed in the U. K. is reported to be more effective than other weedicides. Its use in India, particularly in crop husbandry which is mixed with fish farming and animal husbandry, should be tried out and adapted by our agricultural university research centres before being used in the Country. Another area where further work is needed, probably using some traditional techniques such as letting paddy stalks and roots remain in the field after harvest until decomposition, or the use of blue green algae whose seeds are present in all soils

(see Vol V p 19), is nitrogen fixing in rice crops which can be further enhanced when phosphorous and potassium are added to them. There is need to develop all practices which can fix both atmospheric and chemical nitrogen in paddy soils. Another problem demanding research attention is with regard to Varalakshmi cotton which is being grown in 2,800 acres out of the 36,000 acres of cotton cultivation in Madurai. The cost of pesticide spraying is mounting to the point where the 17 sprayings to be given to each are becoming burdensome. With the resumption of trade with Pakistan, Pakistan cotton will increasingly be a cheap substitute for Varalashmi. Already for 1974, the net income of the Varalakshmi grower has declined from Rs. 800 per quintal to Rs. 400. Hence research is needed to reduce the cost of growing this large staple variety at low cost.

Dairy Farming : The Ambattur dairy, the second one for Madras (see Vol IV p 366), being set up at a cost of Rs. 2.91 crores to provide 11 lakh litres per day going on to 2 lakhs per day ultimately, is being commissioned in April. Simultaneously and perhaps as important is the Madhavaram 120 tonne per day cattle feed plant. With the growing cost of cattle feed, the animal husbandry industry faces many difficulties. In mid February there was received from Denmark 20 bulls and 80 heifers belonging to the Holstein Freisian variety. Given the facts that pure breeds yield less milk than cross breeds in India, the semen from the imported bulls must be used to produce cross bred cattle. It is only then with their higher milk yield (up by nearly 50 percent), that the dairy husbandry farmer can cover the increasing cost of cattle fodder and feeds. In another development, the Tamil Nadu Dairy Development Corporation will be gradually shifting over to polythene bags in supplying the 1.25 lakh litres daily to the city consumers. From mid March it will start using, as Anand does, 5,000 half litre bags and gradually increase the numbers.

Tea : Reports in February indicate that the 1974 tea target of 478 million kgs was exceeded with the North's production estimated at 390-392 million kgs and the South's at 99.6 million kgs, giving a production total of 490-492 million kg. The shortfall in world tea output decreased. As at November, it stood at 760.2 million kgs, due to a steep increase in North Indian Production, as noted earlier. South India at 99.7 million kg recorded a fall of 2 million kg for reasons of drought and the Kerala strike discussed in the last issue (p 155). Sri Lanka and East Africa also had declining production but Sri Lanka earned more because it exported superior varieties. With prices continuing to be high, the tea excise has been increased in the budget rather than reduced. A plantation Association Study Team which examined the strategy for obtaining higher prices for India concluded that (a) lack of adequate market intelligence on the part of Indian producers and brokers lowers the prices, (b) there is no evidence of rigged auctions, (c) improved ware housing, marketing and storage facilities are necessary and (d) there is need for more tea propaganda and more promotional exports by the Tea Board and the industry. On the problem of sick gardens, there are 38 gardens with 20 acres each which have been closed, and 125 with 28,000 hectares which are uneconomic. The government is yet to make a decision on their take over, atleast of those which are viable. The Plantation Association propose to take over 10 sick gardens in West Bengal and Assam with the help of the United Bank of India. The government's policy which allows this kind of initiative should be announced soon.

Coffee and Rubber: World Coffee producers are planning a global embargo on coffee sales to boost coffee prices. The 42 nations coffee producing group meeting in San Salvador in February decided to continue holding back 20 percent of their export quotas, and use this as part of the agreement with coffee consuming nations to be held in London in March. The receipts of the 1973-74 Indian coffee crop as at December 31, 1974 into the pool was 85,893 tonnes, slightly more than reported in the last issue p 156, compared to 90,389 tonnes of the previous season. For 1974-75 due to delayed blossom showers and the failure of the North East monsoon, the crop will be 90,000 instead of the expected 1,00,000. Exports did well. Rubber for January-October was 96,375 tonnes with consumption of all rubbers (natural and synthetic) being 1.4 lakh tonnes, compared to last year's 1.3 lakh tonnes, involving a reduction in the stock of natural rubber, as synthetic rubber production continued to decline in October. The Rubber Board estimates the year's production at 1,49,000 tonnes and demand at 1,55,000 tonnes. The consumers, however, place these estimates at 1,45,000 and 1,58,000, urging an import of 10,000 to 13, 000 tonnes. There must be a rise in price of rubber to cover the increased cost which have occurred since 1971.

* * * * * * *

III Industrial Production

Salem Steel: As against the allocation of Rs. 17.5 crores needed for 1975-76 for the Salem Steel plant (see last issue p. 156), the Union Ministry of mines has provided in its second annual plan for Rs. 15 crores, while the Union Planning Commission and the Union budget for 1975-76 has once more allotted Rs. 3 crores for the project. This will involve a serious delay of atleast 2 years and continuing cost escalation. This is a case where even some deficit financing will be justified, as it will be part ot the capital formation of the Country and will avoid a steep rice in investment costs. In fact similar cut backs and delays in the other two steel plants—Vizakhapatnam and Vijayanagar—have led the Union Ministry of steel to propose to SAIL that Saudi Arabian capital participation or loan assistance be sought to set up a half a million or one million tonnes steel plant at Vizakhapatnam by the installation of a blast furnace for the production of billets to be sold to the rerolling mills of Saudi Arabia with which the loan can be repaid. Similarly it proposed receiving Arab assistance for the setting up of a sponge iron or a refactory plant at Vijayanagar, which can then export these products to the Arab countries. SAIL, however, is opposed to obtaining such assistance and this issue should be resolved by the Planning Commission.

Neyveli: The cumulative losses of Neyveli referred to in Vol IV p. 685, amounting to Rs. 55.80 crores as at March 31, 1975 are the subject of important decisions by the Union government as a result of which the Plant will be relieved of this burdensome heritage. The decisions are: (a) The loans amounting to Rs. 39 crores are converted to equity capital: (b) the repayment of the loan of Rs. 3 crores made in 1974-75 is postponed to 1979: and (c) the financing of future plan investments will be on the basis of a debt: equity ratio of 1:1. Thus the total investment in the plant of Rs. 175 crores (Rs. 80 crores of equity capital and Rs. 95 crores in Loans) will now be in a position to improve its earnings by Rs. 3 crores, pay its way and not have a loss for 1974-75. (The annual losses from 1971-72 have been Rs. 2.80 crores, Rs. 3.59 crores and Rs. 3.60 crores and a higher amount for 1974-75). As pointed out in Vol V pp 91 & 92, the main reason for the continuing loss suffered by the plant has been under utilisation of the briquetting carbonisation plant which produced less than 1 lakh tonnes and starved both the power plant and fertiliser plant of lignite. Now with the decision to oil fire the briquetting plant boilers (Vol V p 92), both the urea production can be nearer the capacity of 1.52 lakh tonnes, and power generation can be stopped up to 250 MW. The 1975-76 allotment by the Union Government for the expansion of the mine from 3.5 million tonnes to 6.5 million tonnes by the allotment of Rs. 16 crores (see Vol V p 91) is confirmed by the Union Planning Commission and is in the 1975-76 budget. Actually amount will be increased on receipt of the report of the West German consultant firm's report for the equipment costing Rs. 40 crores. Half of this will be a West German credit and the other half must be found from other sources.

Kalpakkam: The Kalpakkam Plant in order to improve its safety arrangements, established in February an environmental survey laboratory. The laboratory will assess the base line radio activity in the atmosphere due to atmospheric fall out and other chemical pollutants that occur in the Kalpakkam area before the nuclear power plant is commissioned. This will enable separate measures to be taken to counter radio activity emanating from the two causes.

Hindustan Photo: Further to the encouraging report on the Hindustan Photo Films made in the last issue (p 157), five achievements of the units need special mention. First it is able to produce polyester based x-ray films, using entirely indigenous equipment and material. This will not only meet the needs of our hospitals but the new machine processing developed by the unit will enable hospitals to get their x-ray films within 4 minutes of its being taken. Second the unit will be setting up a plant for the production of the new polyester base and so reduce its import content from the present 100 percent to 15 percent. Third this polyester based x-ray films have a very big export potential and can meet the export needs of many developing countries. Fourth the unit has speeded up the production of all different varieties of films from 5 metres per minute to 16 metres and x-ray films from the present level of 1.80 million sq metres to 3 million sq metres, with the production of all films going up from 6 million sq metres to 10 million sq metres. Finally on the basis of these achievements, this unit is negotiating with a foreign collaborator, possible Agfa of West Germany, for the technology for the production of colour films. This is a good record for a unit which till last year was high on the sick list.

Sugar: The combination of the drought and the strike (see Vol V p 101) resulted

in a decrease of sugar production in the State to 4.25 lakh tonnes against last year's 4.69 lakh tonnes and in contrast to the increased All India production. Instead of crushing 53 lakh tonnes of cane, the mills will be crushing 49 lakh tonnes and the resulting decrease of 35,700 tonnes will involve a loss of Rs. 6.43 crores. The strike of 14,000 workers in 16 sugar mills resulted in a loss of 350 crushing days and have delayed delivery to STC of some 7,000 tonnes for export. Prices have not gone up mainly because of the increased availability of Khandasari from Andhra Pradesh. There is a continuing agitation for increasing the levy price of sugar which will have an inflationary effect.

Leather : As expected and analysed in the last issue p, 159, exports of leather and leather goods declined by 16.7 percent in the first nine months of 1974-75 from Rs. 140.40 crores in the corresponding period last year to Rs. 120.27 crores this year. wet blue chrome and tanned hides and skins exports fell from Rs. 52.09 crores to Rs. 30.45 crores and El tanned hides and skins from Rs. 70.86 crores to Rs. 53.17 crores, due to the policy to cut back on leather exports, adverse international market conditions and fall in U.K. and Italy demands. On the other hand exports of finished leather jumped from Rs. 7.42 crores to Rs. 21.11 crores and industrial leather from Rs. 7.48 lakhs to Rs. 59.6 lakhs, footwear exports from Rs. 5.16 crores to Rs. 9.42 crores due to brisk demand for foorwear in U.S. and USSR. The government is offering an incentive for finished leather exports of 10 percent ad valorem, for uppers 15 percent and for footwear and other goods 20 percent. These incentives are to be announced along with a further cut in export of semi-processed leather. Taking 1972 as the base year, a 20 percent cut in East India and Chrome tanned hides and 10 percent in other skins were announced for 1973, and continued in 1974. Now, for 1975 a fourth cut of 10-20 percent is in the offing. The Leather Trade in the State (the majority of the country's 800 small tanners are in Tamil Nadu) opposes the cut of 15 percent recommended by the development Council for Leather and leather goods industries because the tanneries in the State would be badly hit and above all the infrastructure for turning raw hides and skins into finished leather goods is not ready. The government's plan to increase the export of finished leather and leather goods from the current Rs. 21 crores to Rs. 150 crores by 1978 and of all leather exports from the present Rs. 190 crores to Rs. 600 crores calls for the development of sophisticated machinery and auxiliaries like finishes, chemicals and resins which are being imported today with duties ranging from 100 to 300 percent. While tanning is a small scale and labout oriented industry, manufacture of finished leather and leather goods with modern machines end chemicals will call for new production structures which will have to be developed. This was the burden of the Annual leather fair and get together at Madras in February. The Indian Institute of Foreign Trade in its study computes that for achieving the target of Rs. 600 crores given the lack of resources of the small tanners, the import of Rs. 4.81 crores of machinery and equipment must be permited, if atleast 24 million out of the 36 million pieces of semi-processed hides and skins are to be converted into finished leather by 1978-79.

Binny's leather machines : Binnys has five types of leather processing machines and is in process of developfing an electronic area measuring machine with cent percent Indian technology. Tanneries in the

State commend it for its accuarcy as well as its cheapness—being 40 to 50 percent cheaper than its imported counterpart. This is a case where a small R & D department (Rs. 20 lakhs a year) has produced impressive results.

* * * * * * *

IV Education, Science and Health

Unrest in Educational Institutions : The 14 cases of student unrest and agitation and 3 cases of teachers' agitation reported in February fall into 4 groups. There were 4 cases – Delhi, Raipur, Morghyr and a girls' institution in Ahmedabad—where the agitation was based on educational demands. The Delhi demonstration was for a change in the educational pattern as well as making education free upto higher secondary. Raipur also was based on the demand for exemption from tuition fees, uniformity of fees and preference in employment to local candidates but leading to such violence that a curfew had to be proclaimed, Monghyr's was a novel case —locking up the principal and teachers because they were neglecting their duties. The Ahmedabad girls protesting against non issuance of SSC forms to 80 students went on a rampage, breaking chairs and school furniture and attacking the principal and teachers. A second group of cases was related to travel facilities, leading to hold up of trains at Tirumangalam near Madurai and bus transport problem in Varanasi, Calcutta and Rajim in the Raipur division. A third group arose from misbehaviour and rowdyism as in Lucknow where police entered and beat up the students, Allahabad where a cricket match was disrupted, Ariyalur and Raipur again where allegation of theft and rowdyism sparked off riots. In the case of agitation caused by teachers there were wide spread demonstrations by teachers in all the States at the end of February as well as the staff at Pilani for enforcing the new UGC scales of pay and in the case of Delhi against the UGC decision to scrap the preceptorial tutorial scheme. All added upto a troubled month in academia and yet little action to meet the trouble.

Educational Reform : The UGC Committee's recommendation to abolish the tutorial system in 1958 in the Delhi university might seem a retrograde step. But a wide and intensive study by the committee showed that, with our capacity for distorting even the best systems, the tutorial system had broken down in Delhi and had become another means of taking leave and time off from work. The tutorials were never held or if they were, lasted only for 10 or 15 minutes when attendance was marked and no work done. The committee therefore, recommended that tutorials be replaced by a system of regular assignments, including class tests with assessments and follow up discussions, on the basis of which the teacher should submit the marks or grades to the Principal. This is a good and sound alterna-

tive. In Andhra Pradesh two unitary universities are being established—the Nagarjuna university at Guntur and Kakatiya university at Warangal. It would be wise to allow these 2 universities to develop a more vocational and indigenous curriculum, than that of their parent universities. Of the 12 universities selected for examination reform by the UGC, eleven have set up committees to evolve a detail plan for such reform. In addition a number of States are reforming the relevant University Act in order that autonomous colleges may be launched next year. It is hoped that this session of the Tamil Nadu legislature will amend the Madras and Madurai University Acts for autonomous colleges to be established in this State. Another UGC Committee under Dr. Shantappa has recommended that a new post-graduate degree between the M.A. and Ph. D. be introduced, called M. Phil, Master of Philosophy. It is in use in some universities, and is a good one year post M.A. course in research methodology, which will be useful for teachers who cannot spend the time needed for the Ph. D. course. An interesting reform programme is being attempted by NAYE in establishing in 12 Delhi colleges small business enterprises, which will be run by students as a form of practical training in self employment. This Student Entrepreneurs Small Business Alliance (SESBA) will also meet students' commercial needs. The Madras University is attempting to upgrade the qualification of university and college teachers. For tutors and demonstrators posts, first and second class graduates have to be appointed, while lecturers and assistant professors must have a master's degree. Similarly the qualification for heads of departments have been strengthened as well as that for principals. At the school level, the Union government has arranged for all higher secondary and central schools to switch over to the 10+2 pattern from June 1975 and the 1975-76 budget provides the needed funds. The State government committee on this pattern is at work but it is unlikely that the new pattern of 10+2+3 will go into effect this academic year. A recently released report of a committee which examined the Kashmir education system is typical of the system in all States. Referring to the expansion of university education from 207 to 1,518 arts graduates and 42 to 1,035 science graduates, and from nil to 591 MAs and 210 MScs and between 1950 and 1972, the report says "now the system is producing more and more of less and less employable persons. One reason for the educational explosion is that tuition at all lavels is free." Secondary causes are academic, preparing the student for college only, educational norms have been thrown overboard for political reasons, school enrolment figures are exaggerated by 67.47 percent, stagnation is on the increase because of poor teaching and wastage because of parent's poverty. There is no supervision. The committee proposes a reform in line with that of Fifth Plan strategy (see Vol II No 11 pp 31-33) aimed at improving standards, vocationalising curriculum, separation of Pass and Honours courses at the University and a massive programme of adult education. It will require a strong leader in any State to put this kind of much needed reform through and it is hoped that new leadership in Kashmir will provide this. In this State plans are being developed to extend urban medical school inspection programmes to rural areas. The committees surveying non-formal education in the State and review the State's educational expenditure are at work, with strong support from the government in both these important areas.

Status of Women: The committee on the status of women in its report placed

before the parliament in February recommends setting up a statutory autonomous National Commission and similar State Commissions to improve the status women, and the establishment of womens' panchayats at the village level with autonomy and resources of their own to operate welfare and development programmes for women and to ensure greater participation by women in political processes. It also recommends tribunals to deal with all violations of women's rights, reservation of a minimum 15 percent candidates for women by political parties and their inclusion in all important committees and commissions. Monogamy should be the law, and offences against child marriage and dowry Acts made cognizable, along with the creation of a cell in the labour and employment ministry to deal with women's employment problems. Free education for all girls upto secondary education, the introduction of sex education from middle school, 50 percent primary school teachers being women teachers are other recommendations. It is a pity that the committee did not pay more attention to women's education and literacy problems. Women illiterates range from 45.69 in Kerala (educationally the most advanced State) to 73.14 in Tamil Nadu, 73.67 in Maharashtra and 96.29 in Arunachal Pradesh. For the country as a whole in 1973 the government estimates that there were 280 million adult illiterates. Jammu and Kashmir leading with 73.25 percent, followed by Rajasthan 71.26 percent, Bihar 69.36 percent and Madhya Pradesh 67.3 percent.

Science : The Bhaba Atomic Research Centre is developing high power lasers for use in controlled thermo nuclear fusion research. It is also investigating the possibility of producing helium from the hot springs of West Bengal and Bihar. In view of the oil crises, the Union Planning Commission has requested the Department of Atomic energy to revise upward its approved Fifth Plan for Rs. 497 crores, which has been resubmitted for Rs. 630 crores. The Union Planning Commission also approved a proposal for setting up a Computer Maintenance corporation under the Electronics Commission, with an initial investment of Rs. 184 lakhs to undertake repair and maintenance of the computors now in use in industries, universities and research establishments. The computer at CMTI is a central computer which handles and processes data for the numerical control machines for manufacturing Processes. Automatically Programme Tool language APT—is the language used for engineering drawing, with the further refinement of the United Computing Corporation's version of APT—UNIAPT—being now used at CMTI. It has a multi user/programming system supporting upto 16 laser terminals. Matscience in Madras on the occasion of its 13th anniversary released 3 reports in further pursuit of mathematical application of analytical methods to technology and life sciences.

Health : The research project on the genetic control of mosquito (see Vol IV p 601) which was to be launched in the field experiment stage at Sonepet was called off there for political reasons and has been shifted to the filaria endemic areas of Tamil Nadu, Maharashtra and Saurashtra. The headquarters of the unit has been shifted to JIPMER in Pondicherry, where the scientists are at work carrying out the research investigations. The second family planning camp organised by the Madras Corporation started on February 20 and is aimed at performing vasectomy operations at the rate of 100 per day to reach a target of 5,000. Workers have been coming to the camp from their industrial units in groups. Each person received Rs. 60 and 4 kilos of rice. In ac-

cordance with the recommendation of the State Planning Commission in 1973 (see Vol II No 9 p 33) and the Tamil Nadu Homeopathy Council (see Vol II No 10 p 30), the government is planning to establish a Homeopathy Medical college and a 50 bed strength hospital. It is awaiting the report of the government hospitals committee (see Vol IV p 692) in order to effect some economy in its expenditures, but even more to ensure full and proper utilisation of available hospital facilities.

* * * * * * *

V EMPLOYMENT

In February, industrial relations continued disturbed. The most serious disruption was caused by RBI class I officers working to rule, and class III and IV staff going on strike over the question of who should dust the offices. The result of the strike was that some Rs. 400 crores of cheques were uncleared, business in Madras, Bombay, Calcutta, and Delhi were paralysed, until the class I officers suspended their agitation on February 21, and class IV on February 22, on the payment of an ad hoc lump sum to class I officers and the promise of negotations with class IV ones. The 44 day jute strike which involved a serious loss of Rs. 7.5 crores including sizable foreign exchange ended on February 22 when the six central trade unions called off the strike, and all jute mills reopened, accepting the governments proposal for ad hoc payments to the workers. In the State, the secretariat staff conducted an agitation for higher (central government) DAs which led to derecognition of the Union, dismissal of 600 temporary staff, which were rescinded on their returning to work, and the government agreeing to examine their requests sympathetically. Ten union government organisations repudiated the agreement between the government and the Employer (see last issue p 164), and have threatened to start an agitation on March 13. In Orissa, 2,400 doctors went on mass casual leave for 2 days, completely disrupting medical services in the State. Again the first all India bidi and cigar workers, conference met in Vellore on February 5 and formulated the wages, DA, bonus and leave demands of the workers which will be the subject of agitation from March 17. The Indian Cotton Mills Federation announces that as a result of the latest wage settlement for Tamil Nadu textile workers (see last issue p 164), the lowest paid Tamil Nadu textile workers who in January 1974 was receiving less than his counterpart in Bombay and Ahmedabad (Rs. 312.57 in Madras, Rs. 364 in Ahmedabad and Rs. 330 in Bombay), now receives more than the others (Rs. 420 in Madras, Rs. 407 in Ahmedabad and Rs. 402 in Bombay). Finally a new wage agreement was established for 1.5 lakh plantation workers in Tamil Nadu for a 3 year period, under which wages for men/women, adolescents

and minors will be Rs. 5.80, Rs. 5.30, 3.48, and 2.90 respectively. The coffee workers are to get 5 paise more than the tea workers so as to bring about parity in their wages. Looking back to 1974, there were 31 million days lost in such industrial unrest in the Country (up from 16 million mandays lost in 1973 see Vol IV p 385). In the public sector the man-days lost increased from 4 million in 1973 to 7.7 million in 1974 (mainly due to the railway strike), while in the private sector it increased by 3 million mandays. On the employment side, as noted in Vol V pp 101-102, the most impressive and innovative scheme was Maharashtra's employment guarantee scheme (EGS) which will be financed from a tax on additional incomes from publicly created infrastructural facilities and a profession tax. The annual cost of the scheme is Rs. 50 crores 60 percent of which will be in wages. The scheme will achieve full employment in the rural sector for every able bodied person, which will create permanent productive assets like minor irrigation works, soil conservation, percolation tanks, land development, rural roads and afforestation. It estimates that 3.76 million male and female adults will seek round the year or seasonal employment under the scheme, requiring the provision of 14.3 crores of mandays work in a year. The workers on every work site will be grouped suitably, and wage related to the quantum of work done by each group. Each worker would average Rs. 3 in wages. This scheme should be adopted also in the State, after this drought year is passed. CSIR's August Technical Man power Bulletin reports 10,333 scientists in the pool at 30 June 1974, 35.7 percent being scientists, 31.7 percent engineers, 27.3 percent medical personnel and 1.5 percent social scientists. More than half the scientists were trained in the U.S., 11 percent in U.K., 9 percent in Canada and 12 percent in the Country. The November issue reports that over 13,500 doctorate degrees were awarded by Indian Universities between 1951 and 1972, the annual awards increasing from 95 in 1950-51 to 485 in 1961-62 upto 1,619 in 1971-72. Chemistry accounts for one third, Physics 15 percent, and Botany, Agriculture and Zoology, each forming 7 percent. Calcutta has the largest number (1,785), followed by Bombay (971), with Madras at the third lowest (575). The specialisation of each University centre as well as the Indian Agricultural Centres is also set forth in one of the tables,— which shows that our universities except for agriculture are not really specialising in areas. On a small scale, the IOB self employment programme in the State has assisted 1,500 Persons, with loans for employment. Its recovery rate is very good at 99.68 percent, which means its loans of Rs. 15 lakhs last year were made on sound business principles, expeditiously, and when needed. Collections are on a personal basis. The bank is extending the scheme to Madurai.

* * * * * * *

VI Other Items

Round Table of Economists:

The G.D.Somani Second Round Table of Economists met in Bombay on February 1 and 2 to discus the causes for the concurrent state of inflation and stagnation which is called by the rather ungainly term, stagflation, and proposed remedial measures to help lift the economy out of this double malaise. The conclusions of the round table are set forth in the third article in this issue.

Silver Jubilee Gujarat Adult Education Association :

Gujarat initiated its celebrations of the 25 years of the State Adult Education Association on February 3. The State shares with Maharashtra a long and valued tradition of the great national and State leaders — Gandhi, Patel, Maraji Desai, S. Desai starting and involving themselves in the Adult Education movement and the State Government to this day financing its activities. The Association is helping the government to launch a non-formal, education programme for illiterate and drop out adolscents in some 100 centres this year, and is intensifying its adult literacy drive.

Platinum Jubilee Voorhees College:

Voorhees College, Vellore, celebrated its 75th year on February 11. From a small intermediate college of some 20 boys, it has today under its able and dynamic Principal expanded into a graduate college with over 2,000 students. The celebrations were used to plan the further development of the college as a post graduate institution, for which a block of buildings in memory of its first Indian Principal, V. P. Adiseshiah has been built. The Vice Chancellor of Madras university who was present at the celebrations pledged speedy recognition by the university of the post graduate status of the college.

Silver Jubilee of the Madras Institute of Technology:

The Madras Institute of Technology founded 25 years ago has developed into a quality institution specialising in aeronautical engineering, electronic engineering and metallurgy. It graduates 120 engineers a year, after a 3 year post B.Sc., training programme. Its celebrations were inaugurated by the Prime Minister who called for closer links between engineering institutions and industry. The convocation address delivered by Director of MIDS emphasised the serious problem of industrial stagnation, sparked by the 50 percent under utilisation of installed capacity which the engineers must help to correct. The week starting February 22 was marked by seminars and symposia on improved engineering performance and an exhibition of models built by the Institute staff and students.

Exhibition of Polytechnics:

In the Adyar technological complex, there are 10 polytechnics functioning-the Central

Polytechnics, the Government Polytechnic for Women, Institute of Chemical and Sugar Technology, Institute of Garden Technology, Institute of Printing Technology, Institute of Leather technology, Institute of Textile Technology, Institute of Commerce Education, Institute of Film Technology and Institute of Catering Technology and Applied Nutrition: These have developed within the last 10 years on an area which was just jungle and wild bush. The 10 Institutes organised in February an open house in the form of an exhibition in each Institute, demonstrating the main achievements by the students. It was a very good education for the public and for parents of the polytechnic careers available to young men and women in the State.

NCERT :

The second meeting of the Educational Research and Innovation Committee of the NCERT met in February and on the basis of a report of its sub Committee established the research priorities for the year as comprising the educational problems of the first generation school entrants, the development of non-formal education and the link between formal and non-formal education, education for a juster society and quality improvements. It also decided to establish task forces of the NCERT department heads to plan and execute research in these priority areas. A programme of senior and junior fellowships are also to be administered during the year.

Family Planning Foundation :

The Advisory Council of the Family Planning Foundation met in New Delhi at the end of February. The Council reviewed the World Plan of Action established by the World Population Conferences at Bucharest (see Vol IV p 591), and the conclusions of the follow up conference in Delhi in December (see Vol V p 101), and in light of these decisions recommended the programme priorities for foundation for the year. It emphasised a selective approach in Foundation programmes and the need for close interaction with the government. The major programme areas suggested are : (a) demonstration, Action Research projects in rural areas, bio-medical research programmes, projects on communication, population and law and institutional development. It noted the rapid quality programme developed by the Foundation as such in the 43 projects which conform to the criteria and priority recommended by the Council and suggested an expansion of staff support for the programme.

Institute of Public Undertakings :

A meeting of the Institute of Public Undertakings in late February addressed by Mr. P. J. Fernandes, Director General, Bureau of Public Enterprises, clarified a number of issues : that the public sector comprising 6,000 in investment, 50,000 managers and 15 lakh workers covers a wide spectrum from steel and railways to P & T and shipping is the result of a declared and consistently pursued national policy : there is need for each company to declare its financial, economic and social objectives, to optimise its production, to develop a better balance of public sector investment to include consumer goods industries, to define clearly relations between government and company and develop participative management and professionalise its management.

Parent Teachers Association :

The Sixth National Convention of the Parent Teachers Association was held in Madras in mid February. Tamil Nadu has one of the most active Parent Teachers Associations, numbering 10,881, which covers about 1/3 of our primary and secondary schools in the State. The convention brought together some 200 delegates arround the themes of how the associations can help to improve the welfare of the school and community, to increase the education of women and girls in the rural areas, and to devise the most effective means of population education.

Educational Structure :

The second meeting of the committee to recommend the means of adopting the 10+2+3 structure recommended by the State Planning Commission and the CABE was held in February. At this meeting the Committee heard the views of five members of the legislative council who represent teachears. There was general agreement on the part of the legislature on the need to adopt the new structure. The majority recommended that the 10 year school should be broken into 4+3+3. On whether the 2 year post school programme should be located in schools or colleges, there was agreement among the legislators that there should be a flexible arrangement, and that both schools and colleges should be used. There was a plea for training teachers for the 10 year curricula and reforming the examination system.

Educational Finance Review Committee :

Two meetings of the Educational Finance Review Committee were held in February. The committee was inaugurated in the Seminar Room of the Institute by the Minister of education who made a fervent appeal to the committee to examine how effectively the annual budget of Rs. 110 crores is being spent, to suggest economies in the expenditures, and to propose new sources of income, including the levy of fees. At the second meeting, the committee examined evidence on school enrolment, average attendance, and examination appearance in 2 representative districts in relation to the authorised staffing establishments for these schools.

Board of Continuing Education :

Two meetings of the Board of Continuing Education were held in February. At the first meeting the budget for the non-formal Education project, staff and staff rules, and curricula were noted and/or approved. The Board also visited the school. It thanked the government for the grant of Rs. 50,000 for the project. At the second meeting the sub committee of the Board reviewed the reports that had been received for the survey of non-formal education in the State and reviewed the format of the report to be made to the government on the subject.

Techniques of Socialist Planning :

At a special seminar at the Institute on February 10, Prof. Janos Kornai of Hungary led the Seminar on mathematical techniques in Planning. He used his Hungarian experience to show how traditional tehniques (non-mathematical) limited the policy options available to the planning authority, and how mathematical techniques can be applied by the University staff who are not full time members of the Planning Commission. In the discus-

sion that followed the limitations arising from the open endedness of State economies, the special features such as the two sector economy etc. of the Country and the State and the limited nature of the statistical data were stressed. There was agreement that more of this method should be used in planning.

Oil Prospects :

A second special seminar on oil prospects by Sir Denis Wright from the United Kingdom was held in the Institute on February 17. Sir Denis's thesis was that the oil crisis will be with us for atleast a decade, that there is no alternative to reliance on the West Asian oil reserves and that there are possibilities of oil producers who need the technology and goods of oil consumers who need the oil, coming together. In the meantime the vast financial reserves of the OPEC countries must be recycled. In the discussion it was pointed out that the oil reserves of the Soviet Union and China must also be taken into account, that the oil prices today represented a fairer rental element and that an international investment agency was needed to bring investors and those with investible projects together. It was agreed that the world was on the eve of vast structural changes.

Inter disciplinary Research Methodolgy Workshop :

Acceptance for participating in the workshop as of February 28, have been received from the following 19 persons : R. Subramanian, Gandhigram; M. Madiah, Mysore; Mohammed Mohsin who wishes to be replaced by M.A. Baker, Calicut; N.B. K. Reddy, Tirupati; N. Subramanian, Madurai; A. Ramaswamy, Annamalai University; P. K. Misra, Mysore; K. A. Cheluva Raju, Bangalore; K. R. Nanekar, Nagpur; B. Sarveswara Rao, Waltair; Gautam Mathur, Hyderabad; G. Rama Reddy, Hyderabad; M. V. Pylee, Cochin; T. E. Shanmugam, Madras; C.Lakshman, Hyderabad; M. Abel, Madras; Gopala Sarma, Dharwar; V. Shanmugasundaram, Madras; and L. Yadava Reddy, Hyderabad. In addition Mr. Hanumantha Rao, Institute of Economic Growth, New Delhi and Prof. Moonis Raza, Jawaharlal University, New Delhi have agreed to act as resource personnel.

March Development Seminar :

The paper for the March Development Seminar,Energy Problems in Tamil Nadu, by Prof.S. Sampath, Deputy Director, I.I.T. Madras together with a summary of the discussion at the seminar on the paper, under the chairmanship of Dr. A. Ramakrishnan, Director Matscience, Madras appears as the first article.

Second Article :

A paper on, Population—our concern, appears as the second article.

Stagflation :

The conclusions of the Bombay Round Table of Economists appears as the third article.

Book Review :

The review by Prof. T. C. Mohan, Project Director, M I D S, of Economics of Rural Change, and also the review by Prof. T. Venkataswami Prof. and Head of the Department of Economics, Presidency College, of G. Venkataramani's Minor Irrigation in Tamil Nadu appear in the Book Review Section.

ENERGY PROBLEMS IN TAMIL NADU

BY

Prof. S. SAMPATH,

Deputy Director, Indian Institute of Technology, Madras.

1. Introduction :

1.1. Throughout the world today, the problem of energy dominates the thought and action of every one in society. This is because there is hardly any sector of human activity which does not call for the deployment of some form of energy. The seriousness and menacing dimensions of the problem were thrown into sharp relief by the oil crisis that burst upon the international scene in 1973. The Indian economy, already under heavy weather, has been shaken by this development. The Government of India, besides responding in normal ways to the exigencies of the situation, has shown its concern for establishing long-term views and practical goals in this area by setting up a Central Ministry for Energy and constituting a Cabinet Committee to guide the concerned Ministry. We are at the moment busy grappling with the energy crisis as it hits us in the form of a crippling shortage of electric power. The sustained growth of our economy demands that the availability of electric power be at least slightly ahead of the demand. Power is upstream of most production activities and unless this lead is provided the economy would be stultified. We need, in this matter a long term perspective and a blue-print for well-planned effort. This is what the National Committee on Science and Technology attempted to provide in 1973.

1.2. *The National Science and Technology Plan in the area of Energy Fuel and Power* : This area was considered to be of prime importance for national development and several guide-lines were proposed by the NCST. These may be usefully reiterated :

(i) *Fire- wood, Charcoal and Agricultural Wastes as Fuels* : In our country, these continue to be used as main sources of energy. Their indiscriminate use leads to progressive deforestation, soil erosion and climatic changes, as also impoverishment of the soil due to the use of cowdung as fuel. It is essential that schemes be formulated for the substitution of these by commercial fuels.

(ii) *Coal*: This is a major commercial source of energy and will retain this position for several decades to come. The country should develop technologies for the more efficent utilization of high-grade coal in order to conserve this scarce natural resource. The bulk of our coal belongs to the non-coking and low-grade variety. We should pay attention to methods of judicious use of low-grade coal, such as by the use of low-temperature carbonization for the production of soft-coke, hydrogenation for conversion to oil and gasification. Technological efforts to reduce the cost of transformation of coal are urgently needed.

(iii) *Oil*: This will be the next largest source of energy. By 1978-79, the national demand for oil products is likely to reach 38 million tonnes. How much of this we will be in a position to obtain by import is hard to guess at this time. Side by side with the intensification of our oil-exploration effort and attempts to locate oil in the off-shore areas of our country, we should take steps to develop technologies that will reduce our dependence on oil. Some of the steps that will help in this quest are; the reversal of the present trend to replace coal by fuel oil; the introduction of hydrocraking plants using cheaper imported fuel; the production of oil from coal by hydrogenation; and the replacement of kerosene by coal gas or LTC coke.

(iv) *Electric Power*: As far as we can see, electricity will be the largest provider of power and one of the biggest consumers of fuel. We also note that at present there is a gross inadequacy in the field of power development for the country as a whole. Big technological gaps are evident particularly in the field of heavy electrital equipment where manufactures have tended to rely largely on imported technology and turn-key installations. The successes achieved by Bharat Heavy Electricals Limited in recent years in the manufacture and operation of power plants are pointers to the type of national effort that is needed to develop know how and technology indigenously and restrict imports to critical areas only. Hydro-electric generating plants have performed better than thermal-power plants; and this is the case with other countries also. The average sale-value of power in the country is currently at a figure of Rs. 500 crores and the output of electrical equipment around Rs. 500 crores annually. The output of R & D in the Power sector is a usefully inadequate sum of Rs. 10 crores. The situation calls for drastic changes both at the national and regional levels.

The NCST, after due deliberation, took the view that the technology of 500 MW single-unit generating sets would help to bring about a drastic reduction in the cost of power. The basic skill and facilities needed for the development and fabrication of such sets are believed to be available within the country, but these are widely spread among manufacturing units, R & D establishments and academic institutions. The need is to weld these dispersed capabilities into a single-minded national effort that may yield to us, by 1980, a prototype 500 MW Thermal Station.

(*v*) *Nuclear Energy :* In this sector, our national strategy should continue to be emphasised on natural uranium power reactors. The first system of this kind was built with imported technology and it has become clear that a number of elements of this technology are not suitable to our conditions. A major programme of design and engineering in the adaptation of the Canadian type Reactor is urgently called for. Germane to this effort will be our ability to produce heavy water as well as the crucial fuel elements. Signal success has been achieved, with regard to the latter, at the Hyderabad Nuclear Fuel Complex. The design and engineering of heavy-water plants pose challenges that have to be met. The basic rationale for adopting the natural uranium type power reactor was the development of a system that would convert uranium to plutonium with maximum efficiency. In this process, we are able to combine the turning from our limited resources of uranium to our extensive possession of thorium with maximum power production in thermal reactors. Uranium enrichment is the key-effort to be made and we have a vital stake

in Fast Breeder Technology. The Reactor Research Centre at Kalpakkam which has been set up to nurture this frontier-area scientific and technological effort, is a symbol of our keen desire and determination to generate the requisite capabilities through indigenous R & D. It is a happy augury that this important research activity has been mounted on the soil of Tamil Nadu.

(vi) *Alternate sources of Energy*: These require to be explored and developed in view of the fantastic spurts in the demands everywhere for fuel and power. A strong motivation for them also lies in the fact that the currently used sources of energy are leading to sever environmental pollution problems in industrially developed countries. We need a variety of programmes to assess and follow up the potential of alternative energy sources, such as solar, chemical, wind, tidal, geo-thermal etc.

1.3. *Recommendations of the NCST Panel on Fuel and Power* : The Panel on Fuel and Power, set up by the National Committee on Science and Technology during 1972-73, called upon various Working Groups to deliberate on and recommend R & D activities that should be undertaken during the Fifth Plan Period. The work of these Groups led to a set of proposals that called for a total outlay of Rs. 300-350 crores for the science and technology programmes in the fuel and power sector. The major projects, identified as being of national urgency, are listed in summery form in *Annexure-I* The national effort will revolve around a series of Development Projects and Research Projects, listed in *Annexure-II (a)and (d)* These tasks are to be clearly delineated, funded and regulated by a proposed power Technology Development Board. And following a recommendation made by the U. N. Committee on Natural Resources, set up by the UNESCO at its second meeting held in Kenya in January 1972, that each member Committee should set up a National Energy Institute, the NCST Panel has recommended the setting up of a full-fledged Institute devoted to energy planning for the country based on continuous long-term studies. The broad functions of such an Institute, as envisaged by the Panel, are listed in *Annexure-III*

The problems affecting the State of Tamil Nadu have necessarily to be viewed in the context of the national effort needed to find solutions to overcome the current power crisis. The review of the present position and the proposals for future development, embodied in the NCST recommendations, are undoubtedly of great value in this connection.

II. The Dimensions of the Power Crisis :

2.1 The average per capita consumption of power in the world today is 1,000 kilowatt-hours(units),with the USA leading with 7,000 kwh while ours is an appallingly low figure of 97 kwh, although a few of our relatively advanced States like the Punjab, Gujarat, Maharashtra and Tamil Nadu have touched a per capita level of 150 kwh.

2.2 If we are to maintain the tempo of our development commensurate with the rise in our population, the power-requirement will have to reach 500 kwh per capita in the next twenty-five years. In terms of installed capacity, this would require, if we are to achieve a per - capita consumption of 500 kwh by 2000 A. D. an addition of 4,000 MW every year (20,000 MW over a five—year period) at a cost of Rs. 2,000 crores per year. The world average, already in 1975, is

1,000 kwh. If we set this goal against our record, after Independence, of an addition of only 400 MW per year, one gets an idea of the order of magnitude fo the challenge before us.

2.3 In the case of Tamil Nadu, with a likely population of 90 million people by 2000 A. D., the installed capacity and the needed investment will have to be roughly one-tenth of the national input. To provide for this rate of development, the State will have to devote almost one -half of its entire budget, year after year, on power alone. The odds are indeed stupendous.

2.4 During the country's Fourth Plan period an addition of 9,000 MW of new generating capacity was hoped for but the target achieved was only 4,200 MW. This short - fall produced a sizable imbalance between the demand and the supply of electricity. The position became more difficult because of inadequate monsoon-rains in the important catchment areas feeding the hydro-electric power projects in 1972-73 and again 1974-75.

2.5 There are no States in the whole country, with the exception of Madhya Pradesh and Kerala, which do not suffer from power shortage. The failure of rainfall and the poor utilization of the capacity of thermal stations have added to the short - fall by about 3,000 MW, over and above the loss in installed capacity of about 5,000 MW during the Fourth Plan period. There is thus a basic shortage of 8,000 MW to be overcome and the increase in consumption to be anticipated annually has to be provided for.

2.6 The States which are most affected by the power shortage today are the Punjab, Haryana and U. P. in the Northern Region, Orissa in the Eastern Region; Maharashtra in the Western Region; and Karnataka, Andhra Pradesh and Tamil Nadu in the Southern Region. In the Northern Region, the power scarcity has been persisting for the last two years; in 1974-75 the Bhakra Project which supplies power to the Punjab and Haryana, had the smallest influx in its history. The difficulties encountered both in Orissa and Maharashtra have been the direct consequences of poor monsoons in 1974. In the Southern Region, the main cause of the short-fall in Karnataka has been due to the non-commissioning of the new capacity to meet the rapidly increasing loads. In Tamil Nadu, besides inadequate capacity the operation of the Ennore thermal station has been far from satisfactory and the complexity of the situation affecting the mining of lignite at the Neyveli Project has resulted in gross under utilization of the available capacity.

2.7 According to the Union Minister for Energy, the Fifth Plan Programme has been proposed after a careful assessment of the likely demand by 1978-79 and out of a desire to make adequate power available to meet the anticipated demand. The new capacity needed would be 16,550 MW which will help to boost the energy availability to 1,30,000 million kwh from the figure of 72,420 million kwh which represents the power consumed in 1973-74. Most of the projects that will contribute to this additional capacity are under construction or have been sanctioned. The Union Ministry states that the Government of India has taken a number of steps to ensure that the delays in completing the projects which have characterized all the past plan periods, will not recur. These include : the restructuring of the electrical industry; reorganization and revitalization of the Central Electrical Authority, professional methods of management to be followed by the State Electricity Boards;

and the standardization of equipment and layouts facilitating ease of manufacture, reliability of operation and efficiency. The progress in the construction of new projects will be closely monitored by the Centre. Scarce construction materials would be made available to power projects on a priority basis next only to Defence requirements. A massive effort will be made to produce the bulk of the equipment, required to meet the plan targets, indigenously.

2.8 As a consequence of the follow-up of these proposed measures, it is expected that about 2,000 MW of new capacity would be added during the current financial year, this being the largest increment achieved in a single year so far. Even so, to reach the proposed target of 16,550 MW by 1978-79, we will need to add new capacity at the rate of 3,650 MW annually during the next four years. The magnitude of this task becomes startlingly clear if we note that, during the five years of the Fourth Plan period, the total addition to our capacity was only 4,300 MW.

2.9 The Fifth Plan envisages an extension of the rural electrification schemes — with the primary objective of contributing to an improvement in the quality of rural life. There is provision for the energization of 15 lakh pump - sets and the electrification of 1,10,000 villages.

There will be an action - oriented programme to minimize generation from the existing thermal stations. Improved methods of maintenance and operating schedules, ensuring ready availability of parts and spares and supply of coal of the right quality will be among the major steps to be taken.

2.10 The maximization of generation and the optimum utilization of power resources require that all the systems should work in an integrated manner. This calls for the establishment of stronger transmission systems within a region and between a region and region. The construction of Inter - State Power - lines is being undertaken, on a high priority basis, under a Centrally sponsored scheme. Regional load - despatch centres are being set up in various parts of the Country. The reduction of transmission losses which are at present of the order of 19 percent, will be a major effort during the Fifth Plan period. Steps needed to bring down the losses are both technical and administrative in character and all State Electricity Boards keenly desire to put through all the measures that will help to reduce this wastage of power.

2.11 Major power projects take a long time to fructify and it is essential to initiate action during the current Plan period on those that we wish to accomplish in the ensuing plan period. The strategy for the Sixth Plan includes the commissioning of Super Thermal stations (500 MW and above) at pit - heads and the modalities for this are now under study and investigation.

2.12. In view of the lead - time involved in such new projects, it will be prudent, in the interregnum, to implement expansion schemes at places like Kothagudem in Andhra Pradesh, Koradi in Maharashtra, Satpura in Madhya Pradesh, Talcher in Orissa and Centres in Bihar and West Bengal. There, by themselves, will help in the realization of an additional capacity of 3,000-4,000 MW in two or three years, constituting about 25 percent of the new capacity proposed for the Fifth Plan. Simultaneously an impetus may be given to the hydro - electric schemes, on which preliminary work has

been completed and construction is in progress: Kalinadhi in Karnataka, Srisailam in Andhra and Ravi in the Punjab. It has also been suggested that the fall in the rivers in the Himalayan region at numerous places may be harnessed to produce powers of the order of 20, 30 or 50 KW, to serve the needs of remote areas; and the grids created for individual projects may be inter - linked wherever feasible.

2.13. A dynamic strategy will be needed to overcome the crippling power bottle-necks. The immediate tasks will be concerned with expansion schemes and expeditious completion of partially finished hydel projects. Assistance from the World Bank, for importing the needed raw materials, components and parts, may be sought for the programme on the super - power pit-head stations in new areas. A conscious effort will have to be made to eliminate or minimize regional imbalances. The Heavy Electrical Units appear to be wall poised to set the tempo for implementation of the power projects on account of their ability to guarantee a high level of production of generating sets. The contructiòn of large thermal projects will lead to a larger demand for coal and additional investments will be necessary for mechanizing existing collieries and developing new regions for this purpose.

2.14 The issues involved do not admit of easy solutions. The difficulties may become more acute in the later years of the Plan. There should be no slackening of the effort to meet the challenges that lie ahead.

III Current Action Programmes :

3.1 It will be appropriate at this stage to refer to action—programmes at the national as well as the State - levels. If the investments as proposed are made and if the past shortcomings are ironed out, it would be reasonable to predict that the situation will change considerably for the better.

3.2 *National programmes for Power Development* : In his budget speech on February 28, 1975, the Union Finance Minister rated the Energy Sector as next in importance to the Agricultural Sector in his proposals for stimulating the country's economy. He announced a policy-decision in favour of the setting up, during the Sixth Plan Period, of Super Thermal Power stations of 500 MW or more. A number of such stations would be established at the pit-heads of major coal-fields. They would be centrally owned and are intended to even out regional imbalances in power availability and lead to a more rational pattern of generation and distribution of electric power. The preparatory work on this project would commence in the current Plan period. The grants given to the Ministry of Energy will enable it to set up a Central Thermal Power Generation Corporation in addition to a Central Hydro-Electric Power Corporation.

3.3 The Central Electricity Authority would be reactivated and the State Electricity Boards would be assisted in the professionalization of their management techniques. The budgetary support for the Power Sector for the whole country would be Rs. 140 crores, including funds for the Rural Electrification Corporation. A substantial part of the provision will be for the augmenting of inter-State transmission-lines. The State Plans will provide in all Rs. 900 crores for power during the year.

3.4. There will be a substantial increase in the allocation for coal, from

Rs. 141 crores in the current year to Rs. 229 crores in the coming year. The Coal Mines Authority will be given Rs. 167 crores and the Bharat Coking Coal Limited Rs. 33.5 crores, to help them move toward the target of 135 million tonnes, by the end of the current plan. The enhancement of coal production will come through rationalization of coal-mines, reconstruction of selected pits, building new measures and implementation of other related measures.

3.5 On the Oil front, there is to be a substantial outlay of Rs. 167 crores for the oil and Natural Gas Commission. This amount is largely ear-marked for the acquisition of two off-shore rigs to intensify drilling efforts, a hull for conversion into a crane barge and the completion of the first—stage of the Bombay-High Project, by mid - 1976, to produce oil at the rate of 1 million tonnes per year. For Oil India, there is a Plan outlay of Rs. 34 crores, for the laying of oil pipe - lines, exploration and other connected programmes.

3.6 There will be a substantial invest-ment in the field of atomic energy. The country will buy the bulk of its heavy water requirements from the U.S.S.R., and the rest from the Nangal and Baroda plants in the country. The total budget alloca-tion for 1975-76 will be Rs. 188 crores. More than one third of the provision goes for nuclear power stations under construc-tions at Kalpakkam, Kota and Narora. The Atomic Energy Agency will take over from the Maharashtra Electricity Board control of the Tarapore Switching Yard in an attempt to avert frequent shut-downs which had plagued this project in the past.

3.7 A provision of Rs. 50 lakhs has been made for a project, at Trombay, on an MHD (Magneto-Hydro-dynamic) Generator which will help to develop know-how on the exploitation of this technique for power production. The Department of Science and Technology, Government of India, has set apart Rs. 60 lakhs to support exploratory work on chemical, wind, tidal and, solar energy sources.

State Programmes for Power Development :

While presenting the State Budget for 1975-76, the Chief Minister of Tamil Nadu stated that a 110 MW unit will be added to the Thermal Power station at Ennore and that a special programme has been drawn up, in collaboration with Bharat Heavy Electricals Limited, to improve the utilization of the capacity of the Ennore Plant. The Government will pursue all steps to see that the power generated at Ennore is doubled within a few months. The Chief Minister stated that the Kundah Fourth—stage scheme will be completed by 1976-77; and the Suruliyar and the Tuticorin Thermal Station (First Stage) in 1978-79.

3.9. The Chief Minister registered his disappointment over the delays in the implementation of the Second Mine Cut at Neyveli, which continued to deprive the State of its much-needed power and Ferti-lizer requirement. The Central Govern-ment has announced its approval of a major expansion programme at Neyveli, costing Rs. 87 crores, to help to raise the lignite output to 6.5 million tonnes by 1980-81. The planned first-stage output of 4.5 million tonnes has not been reachad yet. Out of the proposed investment of Rs. 87 crores, about Rs. 40 crores is inten-ded for the replacement of machinery and

equipment needed to achieve and maintain an output of 4.5 million tonnes; and the balance is to bound to step up the output to 6.5 million tonnes.

3.10 This project, on which Rs. 180 crores have been expended so far, continues to incur losses. The estimated loss, by the end of 1974-75, is known to be Rs. 80 crores. The new investments, it is hoped, will change the situation. The project will produce lignite whose cost will be Rs. 46.17 per tonne—still economical compared to coal from Singareni delivered at Ennore at Rs. 53.50 per tonne.

3.11 In order to put the Project in good shape, the Central Government has proposed the following measures: the restructuring of the captial base of the Neyveli Plant, the changing of the feed-stock of the fertilizer plant from lignite to oil; and an arrangement with the Tamil Nadu Government for the payment of a remunerative price for the power supplied from this source. The indication is that a mutually satisfactory arrangement has been reached between the Neyveli Project authorities and the Tamil Nadu Electricity Board.

IV Energy For Tamil Nadu—Problems And Prospects

4.1 Tamil Nadu is not richly endowed as far as energy resources are concerned. All its easily toppable water-power potential has been developed already. Its thermal power plants have to be operated with the aid of imported coal. Against this background, it is significant that the State occupies a pre-eminent position in the Nation in the field of power generation. *Annexure-IV* gives the national picture of installed power capacity as of 31st March 1974. Tamil Nadu excels the Statas in the region both in the generation and the consumption of power.

4.2 Yet the State does not produce enough power to satisfy the demands nor have the targets been achieved. The day-to-day power-deficit of Tamil Nadu is the highest in the Southern Region and probably the highest in the Country. As of a few days ago, the power availability was reported to be 17.31 million units per day as against a requirement of 25.64 million units.

4.3 The State is the natural consumer of surplus power from the neighbouring States, especially Kerala. But in the context of the increasing demand for power to 3,860 MW by 1979 and 6,000 MW by 1984, continued and wholesale dependence on other States will not be a wise policy. Some introspection will be in order here.

4.4 The rate of increase in power generation inside the State has not kept pace with the installed capacity. The reasons are not far to seek: failure of monsoon; the tying up of the hydro-electric plants with irrigation discharges; snags in technical operation responsible for low utilization of the existing capacity (an average of 35% in the last three years); and shortage of coal.

4.5 In spite of the above difficulties, there has been no decline in power generation as such, and the power bought from neighbouring States has shown an upward trend. Yet the State has had to impose power-cuts which have deleterious effects on our agriculture and industry. The basic reason for this situation is known to be the widening gap between the available supply that keeps increasing, even though at a slow pace, and the demand which leaps up without any evidence of judiciouscontrol - factors. There are many instances of haphazard additional line extensions. Prof. T. S. Venkataswamy, in his January 1975 Seminar Paper, drew

our attention to the existence of a discrepancy of 22 percent between the power known to have been made available and the power that could be billed for on the basis of consumption by the regular customers. Transmission line losses will account for a part of the discrepancy (about 12 percent); and the balance can be only attributed to technical shortcomings and unauthorized utilization.

4.6 The current difficulties are, in the main, man-made and spring from the following factors: delays in completion of power - projects for a variety of reasons; low-efficiency of operation of existing plants; high transmission losses; malpractices in power-consumption. Bold initiatives and innovative steps will be needed to take the State out of the impasse.

4.7 A number of interim measures may be implemented in the redeployment of the available power in an effort to avert a major slow-down in industrial operation, such as the following:

(i) Diversion to essential industries in the neighbourhood of surplus power during the slack and lean periods in our daily agricultural operations and during the harvesting season;

(ii) The use by paper and other industries of steam generation for power to the extent possible;

(iii) Diversion by sugar mills of power from bagasse to other industries in the noncrushing season;

(iv) Continous monitoring of the areas of surplus and deficit power among industrial consumers, in both the public and private sectors, and consequential steps to balance out, if only to a small extent, industrial power consumption; and

(v) Encouragement to the fullest use of stand-by generators and captive power plants installed by major industrial establishments.

4.8 Serious attention has to be paid to several long-term measures. More coal fired stations are not feasible, as far as this State is concerned, as coal has to be transported from places more than a thousand miles away. A 100 MW station will require an assured supply of 1,800 tonnes of coal every day. The need to obtain larger quantities of lignite-based thermal power from the Neyveli Project cannot be over-emphasized. The full-scale, satisfactory operation of this project is of vital importance to the State's economy.

4.9 As mentioned before, the State has exhausted all possible development of hydro-electric potential. There is however scope for a number of joint projects with Kerala and Karnataka. Chief among these is the Hogenekal Scheme in Karnataka with a large hydro-electric potential.

4.10 There is the prospect of an international link with Sri Lanka whose power needs and resources appear to be complementary to those of the State. The power-grids of Tamil Nadu and Sri Lanka are separated by 12 miles of sea. The river water flow in Sri Lanka from July to October is low, while the rivers in the State may be in full tide due to the monsoon; it would then be possible for the State grid to supply power to Sri Lanka. Conversely, the Sri Lanka rivers run full from April to June—the dry season in Tamil Nadu; at

this time Sri Lanka can feed power into the State grid. A useful link-up, mutually beneficial, is possible and there are no technical difficulties in this regard.

4.11 The Southern Region has been a pace-setter in the co-ordinated working of power-systems. There is a Regional Electricity Board which is an advisory body. In the context of to-day, serious thought has to be given to the role of regulating agencies with regard to the operation of power-pools. The design and smooth functioning of strongly integrated power-systems are not just technical matters but depend on a series of economic and, often, political decisions.

4.12 While the plans for the creation of new hydro-electric and thermal capacity the Southern Region will have to be on the basis of the pooling of the resources of the four States, there should be a perspective approach encompassing programme in the atomic power and hydro-electric power and the possibility of a super-power Thermal Project based on a second mine cut at Neyveli. Every effort has to be made to relieve the strain involved in transporting coal over long distances. It is a happy augury that, in this Region the currently generated power is being distributed in an optimum manner. In particular, the inter-linking of the grids of the four States has been helpful in "banking" the surplus power of Kerala when there is a likelihood of spillage in the hydro-electric sources or there is the unabsorbed power of thermal stations during periods of low consumption.

4.13 The role that an Institute for Energy Studies can play in the planning and execution of the State's Plan development schemes and in achieving regional co-ordination cannot be too strongly emphasized.

V The Role Of The State Institute For Energy Studies

5.1 The Tamil Nadu Perspective Plan for 1974-84 has envisaged the setting up of an Institute for Energy Studies— as a joint effort in which the State Electricity Board, the Madras Atomic Power Project and institutes with relevant research and development facilities like the College of Engineering, Guindy and the Indian institute of Technology, Madras will participate. Such an Institute should be established without further loss of time.

5.2 The Indian Institute of Technology, Madras has taken steps to organize, with its own resources, an advanced Centre for Energy Research. Three streams of activity are contemplated for the present and the projects in view, listed below, are indicative of the vast scope that exists for nnovative work suited to our needs:

(a) Electric Power Systems:

- Power System Data Collection, Processing and Retrieval;
- Power System Operation and Planning;
- Short-range and long-range optimal operation-plans including maintenance schedules;
- Studies on transmission and distribution losses;
- On line load despatch and control;
- Pollution effects on Power equipment;
- Development of new insulating materials;
- High voltage Transmission Techniques;
- Load Flow Analysis;
- System Fault Analysis;
- Large-scale Power System Performance Studies.

(b) Energy production with the aid of Wind-Power:

Experimental work on the generation of power for rural electrification, the operation of small-capacity agricultural pump-sets etc.;

Design, fabrication and testing of Wind-Mills with power-genarating capacity upto 5 KW.

(c) Solar Energy Utilization:

Design of a Solar Collector-cum-Regenerator, as the basic building block of a 3 tonne room-airconditioner;

Development of Solar Energy Devices, such as Water-Heaters, Distilled Water Units and Air-Heaters for industrial and agricultural drying operations.

5.3 A few days ago, the Union Ministry for Energy has signed an agreement with the Government of the Federal Republic of Germany for collaborative work between IIT Madras and its counterpart institutions in West Germany on energy problems, particularly Solar Energy Sources for power (5 KW-10 KW) that can operate simply and efficiently in a rural setting; solar energy refrigeration-systems that may be advantageously used for the preservation of fish and perishable food-articles; and wind-mill power generation in our country-side and remote locations.

5.4 Chemical Cells, on the technology of which considerable work has already been done in the country, have many promising applications in the present context; rural electrification, automotive traction and railway-traction, to mention only a few examples. Several feasibility studies have been completed by expert-groups set up by the NCST. The State Institute for Energy Studies may assist in the acceleration of projects in this category.

5.5 This Institute should be speedily set up and given the Charter to spear-head the effort for the implementation of the State's annual programmes in respect of power generation, distribution and utilization in the hydro-electric and thermal power sectors. It should assume responsibility for putting the Ennore Power Station on a stable footing of optimum efficiency of operation and output. It should establish a strong link with the Neyveli Project Planners in an effort to achieve, within a prescribed time-frame, the desired targets of power-production. It should assist in the launching of several programmes for finding and establishing the modus operandi for alternate sources of power, in the medium and the small ranges, by funding innovative projects on research and development work relevant to the conditions and needs of the State.

VI Conclusion

6.1 In evolving a long-term Energy Policy for the benefit of the country as well as the State, the following cardinal principles have to be borns in mind:

(i) All estimate of power requirement turn out in the end to be under-estimates, and no power generated ever goes to waste. A liberal outlook in dealing with proposals for additional power generation will be in order ;

(ii) Targets of construction and procurement of materials and equipment have a tendency to unforeseen snags. Timely sanction and commitment of

adequate funds are of paramount importance;

(iii) It is axiomatic that, if anything can go wrong, it will. Prompt identification of the causes of breakdown and outrage, prompt remedial measures against the recurrence of known defects and incessant details will pay handsome returns;

(iv) Generation of power without the infrastructure of an efficient transmission system would be self - defeating;

(v) Power is national and even international in its reach and scope and should be dealt with, in this broad framework, with an effective organizational structure that is flexible, free from parochical tendencies and capable of identifying resources for continuous development;

(vi) The country's hydro - electric capacity should be fully tapped. It will be short - sighted to put all our efforts into thermal power and nuclear plants, as both these produce pollution and enormous quantities of waste - products. Several Research and Development Programmes should be speedily undertaken to tap power from solar energy, from fuel cells, from winds and from the tides.

6.2 Physical resources, on a big scale, are needed for the development of the Nation as well as the State in the areas of power. Every effort must be made to find them. But of far greater significance is a sense of mission, dedicated effort, a perception of the goals and an innovative spirit. These can help in achieving worthwhile results even with meagre resources. Lord Rutherford, the discoverer of the nucleus of the atom, was told by his colleagues that American Scientists, in the years following the discovery, were able to make much greater headway because they were able to make much greater headway because they were able to make large investments on research. His characteristic rejoinder was :

> "The Americans have the money and so they make progress. We do not have money and we have got to think."

In facing the crisis and the challenges before us, it behoves us to take a lesson from the robust spirit of this great scientist. We should cultivate our ability to think and to learn to use our ingenuity to make the resources available to us take us to the destination that we wish to reach.

ANNEXURE–I

NATIONAL SCIENCE AND TECHNOLOGY PLAN ON FUEL AND POWER

MAJOR NEW PROJECTS

Research and Dev. For Power Dev. (1)	Energy Studies (2)	Fuel utilization (3)	Coal utilization (4)	Solar Energy (5)	M H D (6)
500 MW Station	Institute for Energy Studies	School for Boiler Operators	Survey on Pattern of Coal utilization	Institute for Solar Energy Studies	25 MW Plant on Coal Technology
400 KV Tr. Line					
Power Technical Development Board		Reinforcing of Fuel Effy. Services	L T C Plants		
Material Development			Global Tender for 1 million tonne per annum coal to oil plant		
		Fluidized Bed Combustion Chamber			
		Efficient Fuel Oil Burning Equipment	Coal Gesification plants near cities for domestic use and pitheads for power		
		Waste Heat Boilers			
		Anti-Pollution Equipment			

ANNEXURE-I (contd:)

NATIONAL SCIENCE AND TECHNOLOGY PLAN ON FUEL AND POWER.

MAJOR NEW PROJECTS

Chemical Cells (7)	Geo-Thermal Power (8)	Wind Power (9)	Tidal Power (10)	Gas Turbines (11)
Automotive Traction (to reduce dependence on oil)	Material Testing Programme	Maintenance Service for Wind Mills	Pilot Plants on the East and West Coasts	10 MW Power pack for peak load on Oil as Fuel
	Power Generation			
Rural Electrification in Remote Areas	Heating Applications	Cluster of wind Mills for pumping water for irrigation and drinking		10 MW Power pack for base load on Oil as Fuel
	Refrigeration			10 MW Power pack on coal gas as Fuel
Space and Defence Applications	Medical Applications			
	Tourist Resort	Cluster of Wind Mills for Power Service		170 MW Dual cycle plant on coal gas as Fuel

ANNEXURE II (a)

NATIONAL POWER : DEVELOPMENT PROJECTS

1. 500 MW and larger size generating equipment including boilers, turbine, generators and their auxiliaries,
2. 400 KV transformers, Reactors, Lighting Arrestors and other transmission line accessories.
3. Materials Development Projects, especially the materials for steam turbines, boilers, pressure parts and turbo-generators.
4. Linear Motors and Stepper Motors.
5. Effects of environmental control requirements on design of electrical equipment.
6. On - line computer control of power systems.
7. On - line computer control of mill drives.
8. Research for the optimization of distribution systems and development of suitable equipment.
9. Solid state devices and systems for power systems and industries.
10. Reversible pump drive.
11. Statistical techniques for failure Analysis and development of reliability criteria.
12. Gas turbine.
13. Instrumentation and automatic control of power stations and power systems.
14. Fuel efficiency studies.
15. Effect of fuel efficiency on designs of boiler and other power equipments.

ANNEXURE II (b)

NATIONAL RESEARCH PROJECTS

1. Solar Fuel Cells
2. Chemical Fuel Cells
3. M H D Generation
4. Cyrogenic and Superconducting Electrical Devices and Systems.
5. Transmission at 750 KV and 1,000 KV
6. D. C. High Voltage Transmission and Inter - connection of Grid Net - works
7. Thin Film Technology for power applications.
8. Power Generation by combined Cycles (Steam and Gas) Prime Movers.

ANNEXURE III

FUNCTION OF THE NATIONAL INSTITUTE FOR ENERGY STUDIES

1. Energy Planning
2. Energy Studies
3. Transportation/Transmission of Energy
4. Locational Aspects of Energy Intensive Industries
5. Substitution of non Commercial Sources of Energy by Commercial Sources
6. Recycling of By-Products
7. Pollution Studies
8. Documentation and Data Bank
9. Training
10. Publications

ANNEXURE IV

STATEWISE INSTALLED CAPACITY (IN MW.)

(As on March 31, 1974)

STATE GRIDS	Hydro-power	Thermal & Nuclear Power	Total
1. Andhra Pradesh	268	492	760
2. Assam	66	—	66
3. Bihar	15	545	560
4. Gujarat (including contribution from Tarapur)	—	1166	1166
5. Haryana	405	22	427
6. Jammu and Kashmir	49	28	77
7. Kerala	622	—	622
8. Madhya Pradesh	193	705	898
9. Maharashtra (including contribution from Tarapur	844	1401	2245
10. Karnataka	966	—	966
11. Orissa	424	250	674
12. Punjab	706	110	816
13. Rajasthan	376	220	596
14. Tamil Nadu (including contribution from Neyveli)	1224	1030	2254
15. Uttar Pradesh	600	1038	1638
16. West Bengal	37	1264	1301
17. Damodar Valley Corporation	104	1078	1182
18. Delhi	—	532	532
19. Himachal Pradesh	77	—	77
TOTAL	6976	9881	16857

Summary of Discussion

At the Seminar on 'Energy Problems in Tamil Nadu' held in the Seminar room of the Institute on Thursday 27th March 75, under the Chairmanship of Dr. A. Ramakrishnan, Director, MATSCIENCE, Madras; the author in presenting the paper began with the comment that although the problem had been discussed intensively by various forums, these analyses had, however, not laid adequate emphasis on spelling out areas of State action. A recent announcement by the Central Government indicated that five projects in Tamil Nadu namely Kunda IV, Suruliyar, Ennore extension, Tuticorin thermal project, completion of the nuclear station at Kalpakkam and expansion of Neyveli, would add 931 MW to the volume of power generation. The State's powercrisis is part of a country wide power shortage and required an analysis of constraints for working out remedial measures at national and regional levels. The National Science and Technology Plan has recognised the importance of energy for development and has laid down guide lines for R & D projects in respect of firewood, charcoal, agricultural waste, coal, oil, electric power, nuclear energy and alternate sources of energy such as solar, chemical, wind, tidal and geothermal. The implementation of a dynamic energy policy envisages an independent Ministry of Energy, reactivation of the Central electricity authority, Power Technology Develpment Board and a National Energy Planning Institute, which is yet to be established. A projection of power consumption in India forecasts a level of 500 KWh per capita by 2000 A.D. against a current consumption of 97 KWh (all India) and 150 KWh in states such as Punjab, Maharasthra, Gujarat and Tamil Nadu. This would require an annual addition of 4,000 MW to our power quantum every year against our record of 4,000 MW for the last 20 years. For Tamil Nadu this would involve the investment of half the State budget on power generation. This would also necessarily involve a higher outlay on R & D than the Rs 10 crores allocated against a revenue of Rs. 500 crores from power sales. Our performance during the planned era indicates the magnitude of the effort required to achieve the projected levels of consumption. In terms of installed capacity, however, Tamil Nadu leads the other States. Its deficit is also the highest in the Country. Other persistent problems are the 22 percent discrepancy between the power supplied and the power billed for. An encouraging feature is the pace set by the Southern-Region in inter-state Co-operative sharing of power. The overhaul picture is not satisfactory with indifferent maintenance of generation equipment and bottlenecks in coal supply to thermal stations. Prompt and judicious action to improve functioning of this sector must be backed up by research for development of alternate sources of energy. A beginning has been made in the implementing of research programmes at the I.I.T. Madras, Centre for energy studies with West German collaboration. In this connection the formation of a State Institute for Energy Studies, as recommended in the various perspective plan reports, would prove useful.

In the discussion that followed the practical and optimistic approach in the paper was commented upon. Attention was drawn to the radical change in the economics of energy development throughout the world due to the tenfold rise in oil prices from 1970. Unit cost of oil has an effect on unit cost of other forms of energy. Investment in development of alternate forms of energy is no longer relatively capital intensive. A comparison between instal-

led capacity and utilised capacity in Tamil Nadu revealed a dismal state of affairs. The frequent break downs at power stations and the shut down at Kothagudam a week after recomissioning are indicators that minimum technical skills in operating thermal plants have yet to be achieved. As far as Tamil Nadu is concerned a Regional water and power Council would serve its interest best. A source with good energy potential is animal and vegetable waste for production of biogas and gobar-gas with its valuable bye-product of nitrogen rich fertilisers. In this context it was pointed out that gobergas plants had problems of maintenance which had yet to be solved. A query was raised whether the consumption projections were based on studies on energy consumption patterns because projections based merely on per capita consumption at world levels could not serve development priorities. Detailed studies as to priorities in use are essential for realistic projections. The energy target appears to be overly optimistic. Energy planning, particularly for super power stations, called for precise estimates of coal requirements, transport facilities and spare parts availability. Another important consideration was the gestation period before a power station came on stream. Power supply could be regulated by allocation priorities for production of essential goods.

There was general agreement that an effective energy policy required a regional and national approach and should be based sound on technical expertise, well planned back up facilities and active R & D programmes, to be implemented by a State Energy Institute which should not be purely academic but should bring together the existing expertise in the State and Region.

POPULATION. OUR CONCERN*

Our concern :

Population is people. It is men, women and children living in family homes or on the streets, going to school or dropping or being pushed out of schools and colleges, working in the field, factory or office, spread in villages or crowded in cities, going to church, temple or mosque; eating, starving, playing, talking, voting, fighting sleeping, procreating, falling ill, and dying. People face problems and cause problems. Some of the problems they face in our country are unemployment, inadequate incomes and today the increasing prices and how and what kind of meal the housewife can provide the family. They also cause problems—as when they get excited and fight over a religious or caste issue, when they dirty the street, the common water course, or the neighbour's house, and by their sheer numbers. That is, there may be too many persons, who have to live in the one or two rooms which is the majority of our homes or to share the limited meal that has been cooked in which there is no meat, eggs or fish and daily less of milk and milk products, pulses, vegetables and oil. There may be too many children to be accommodated in our schools and colleges and not having the funds to build more schools, employ more teachers and establish adequate libraries and laboretories, we allow the students to drop out or stay out and not crowd our classes. The same is true about our hospitals, nutrition and health facilities generally wherein we see malaria, leprosy, cholera, gastroenteritis, under-nourished and malnourished babies and pregnant mothers increasing all around us. In other words, we find on the one hand a rapidly growing number of people and a continuing, possible worsening of abject poverty around us. Take Bombay, where we are meeting, for example. When we became independent 2.7 million people lived in Greater Bombay. Today 8 million persons are living in the same area. At Independence 1 million in Bombay were poor, today the poor number 4 million. Take our country, soon after our Independance in 1951, our population was 361 million. In the 1971 census we are 548 million persons. Alongside of this increased number of people, our condition of poverty has increased from 140 million people, who were living below the poverty line in 1951 to 280 million poor people today. I am not saying that the increase in the number of people in Bombay or in India has caused increased and degrading poverty in Bombay and India. What I am saying and what we are gathered here in this conference to consider is the simple, honest and dismaying fact of the juxta positition, the co-existence of more persons and more human—physical, mental and spiritual—degradation. This is what the theme of this conference—'Population, our concern'— so simply and eloquently portrays. People are our concern.

Our bias :

Because people are everyone's concern, because everyone is part of people, everyone has views on the question of persons when seen in the aggregate. And so the next step is to come out in the open about the particular point of view from which, the bias with which we approach this concern of ours. Our concern could be familiar. How many children can I as the mother or father look after

* Extracts from the Keynote address by Dr. Malcolm S. Adiseshiah, to the National Council of Catholic women of India—Ninth Annual Conference held in Bombay on 7, November 1974.

well? What kind of persons will make a materially satisfied and spiritually happy family? Our concern can be economic where child-bearing is seen as a household choice determined by the relationship among ircome (the number of children goes up with family income), costs of bringing up children (the higher the cost the lesser the number of children desired), and the tastes related to children (the preference for a large family will lead te more children and vice versa). Our concern can be social—the relation between population on the one hand and food or natural resources or people's standard of living on the other. Our concern may be demographic, to understand the truth of the demographic transition theory, which is that a low income country like ours, starting with high birth and death rates gradually experiences a decline in both rates, alongside of economic development, till mortality rates become stable and birth rates are the result of voluntary decisions rather than of custom or culture. Our concern can be political and military-that is to be militarily strong we should have a large and growing population so that we can have a large and growing army, navy and air force. In these days of push button warfare, the Minister of Defence will want more scientists and technologists than just more cavalry, infantry or even tanks. Finally, our concern may be normative and ethical. What is the good optimum population for my country? What size of family should I have to help reach that optimum? How is that to be related to the values of freedom of each person to decide on his family size, the responsibility for responsible parenthood, access to information and means to help each person have the family that is desired and the discharge of the obligations of maintaining the integrity of the family. I began this second set of issues by saying that on the population issue, each of us has a point of view, a bias. In fact it is more likely that we have a combination of biases. My bias is that of an economist with a social concern enmeshed in some of the normative issues that I have listed. What are yours? And so the second step in this study of our concern is to set forth what is our bias or set of biases and to go on from there.

A consensus on our concern:

How we can try and agree on precisely what our concern is. I would like that we start with what is not involved in our concern. First we are not concerned with identifying the causes for our poverty, because excessive population is not the cause of our poverty. In fact our empirical studies in the country rather tell us that our poverty is the skewness of income and consumption distribution, the bottom 20 percent of our people have a share of 8 percent in total consumption expenditure, while the top 20 percent consume 42 percent of our goods and services—and is due to inequalities in the ownership, control and use of assets—44 percent of our rural households who own less than one acre each have 1.6 percent of total land cultivated while 4 percent of households own 20 acres and having 36 percent of all lands. So too on ownership of urban houses, shares, industrial plants, education, etc. Second, we are not concerned primarily with the question as to whether the use of contraception, the condom, the IUD, the pill or sterilisations and abortions is right or wrong. For some of us the very mention of population conjures up distraught visions of these methods of family planning. We will deal with this question, but only as an off-shoot of one of the the many action issues facing us in our concern about population and people. Third, we are not concerned with defining

the basic or primary function of marriage as procreation or otherwise. There are problems of sexual morality and codes of conduct and the permissive society which should be kept apart from our more limited concern here.

We can now turn to what is it about population that concerns us and on which all of us present in this conference can agree. First, the problem of the rate at which our population is increasing is an agreed cause for concern. The statistics in this regard are familiar to all of us. It took a million years for the world to be peopled by the first billion persons in 1800, 130 years for second billion persons to be born and live in our world in 1930, 30 years for the third billion to people the earth in 1960, and 15 years for us to be four billion people, which is next year 1975. In our country, as I said at the beginning, we will be doubling our population in 35 years from 361 million people in 1951 to 734 million persons in 1986 and will be nearly 1 billion Indians by the end of this century. This means that in addition to finding jobs for 21 million people who are unemployed today, we have to find employment for 1,20,000 persons who are now entering our labour force every week, adding up to some 200 million new jobs that our economy must create by 2001. The problem here is not simply the rate at which our population or people wanting employment is increasing. It is that on the one hand our economy has been stagnating at around a 3 percent growth per annum, while our population has been growing at 2.5 percent, and most of even this small difference of 0.5 percent goes to the top 10 percent of our people, on the other. So the first population concern that we can agree upon is the rapid rate at which our population is growing, the slow or stagnant rate at which our economy is growing and the unjust social structure in which we are living.

A second concern on which all of us can agree is that the increase in our population is brought by a rapidly declining death rate rather than an increasing birth rate. The number of persons living in our country has increased so fast not because too many children are being born, but more because too few of us are dying. Actually our birth rate has been falling from 49.2 per thousand in 1901-11 to 48.1 in 1911-21, to 46.4 in 1921-31, 45.2 in 1931-41, 39.9 in 1941-51 and 37.2 in 1961-71. Thus the babies born has fallen from nearly 50 per thousand persons at the beginning of the century to 37 per thousand today and will be 25 per thousand in 2000. On the other hand our death rate has fallen from 44 per thousand at the start of the century to 14 per thousand today and will be 9.7 per thousand in 2000. Within these falling birth and death rates there are three disturbing facts which is part of our concern. One is that rural birth and death rates are higher by 27 per cent and 7 percent than the rates in cities and towns, reflecting our discriminated rural levels of living. The second is that one third of all deaths in the country are infant deaths, and 25 of every 100 babies born die within one year of their birth, and female mortality at all ages is higher than male deaths. A third tragedy is the death rate of babies is highest for the first born and than falls off —20 percent of the first born die before they are one year old, 17.6 percent of the second babies so die, 15.5 percent of the third, 13.1 percent of the fourth and 10.9 percent of the fifth and 8.8 percent of the sixth babies die in their first year.

What do these facts of our birth and death rates and their tragic composition mean for our concern? It means that

because our birth rate is falling more slowly than our death rate, we have the highest percentage of young people in the world—52 percent of all persons living in our country are below the age of 20. If to this we add 5 percent who are over 60 years of age, it means that a minority has to earn and support a majority of young and old persons in our country. It means increased schools, colleges, sports facilities, and youth clubs and organisations. Further, children between 1 to 5 years who require special nutritional food form 13 percent of our population compared to 6 percent in the advanced western countries. Our age structure also means that we have many more who are at the marriageable child-bearing age than other countries. And for this we need adequate qualified obstetricians and gynaecologists and maternity beds. The higher death rate among women particularly at young and child-bearing ages means a steadily dwindling female ratio and all the social and moral problems that it gives rise to. Finally, the fact that the first two babies have such a high death rate means that a family must have five children if it is to have one surviving child.

A third concern raised by the rate at which our population is increasing in the country, and in the world, is that it defeats the objective of social justice - of closing the gap between the rich and the poor. A recent impressive international study shows that if the gap between the rich countries whose annual per capita income is $3,000, and the poor countries whose annual per capita income is $230 is closed by the year 2000, so that every person in the world at that time will have an income of $3,000, then on the modest assumption of 5 billion persons living in our world in 2000 AD, we will have to produce 13 times our present aluminium, 9 times our copper, 7 times our iron, 11 times our lead, 25 times the coal, gas and oil that we produce, double the water and agricultural land available in our world for our food, a nine-fold increase in electricity generation and similar magnitudes of schools, colleges, hospitals, houses alongside of unbearable levels of pollution of air, land and water and unmanageable quantities of waste. The point of this picturisation is that (a) the goal of international equity cannot be attained at the level of living to day of the rich countries because we do not have the metals, the energy, the water and food sources to do that, and (b) that goal even at a lower living level all over the world, say with an income of $500 for everyone everywhere, will be defeated if the population goes on increasing at the present rate which will mean not 5 billion but 7.5 billion people living in our world, with over 6 billion living in the poor countries in 2000. Let us remember the grim fact that even at the present rate of our consumption, the life time of our mercury reserves is 15 years, of tin and silver 20 years, of lead and zinc 20 years, of petroleum and copper 35 years, and of natural gas 40 years. I must admit to two unknowns in this analysis, namely that cannot see the people in the rich countries cutting back their incomes to one-sixth their present levels and equally I cannot foresee what future break-throughs that technology can and will bring. I was told recently that we have already produced through plastics a full meal. Allowing for these unknowns, one lesson that I draw is that we cannot have both increasing population and the closing of the gap between the rich and the poor countries. The same contradiction applies to our country. 82 percent of our households have an income of less than Rs. 2,000 a year, while 1 percent of our households have incomes of over Rs. 10,000 a year. If closing the gap between these two sets of households, the poor and the rich, means all our 100 million households

being brought up to the income level of the top 1 percent, we will face the same problem as that of the world. We will need to produce or import some 12-15 times the metals, the water, the energy and the electricity, the housing materials and fertilisers, and food resources that we with all the attendant damage to our eco-system, will shift from the lesser pollution of poverty that we face today to the pollution of affluence that is being experienced by the rich countries. This is where the Gandhian model of closing our gap at a level of sufficiency involving a redirecting of our production and consumption systems becomes relevant. Even for that life of simplicity and sufficiency for the 1,000 million people who will be living in our land in 2000 A.D., we will need to produce 200 million tonnes of food grains instead of our currrent 100-110million tonnes, 20million tonnes offertilisers instead of our present 5 million tonnes, 200 million tonnes of coal in place of our 70-80 million tonnes, half a million new schools, and so on. The attainment of our goal of social justice, of equality, thus calls for our accepting sufficiency as the individual and family life style and a sensible slowing of the rate of our population increase.

A final but decisive population concern that I would like to place before you is a moral concern. I have referred to the problems caused by the high rate of population growth with its awesome effect on the employment situation. This we can control and balance. I have called attention to the consequence of our falling birth and death rates and their effect on the burdensome demands for schooling, health facilities, nutrition and child and maternity care. These too we can provide for with appropriate technologies and organisation. I have expressed our concern about the receding goal of human equality and social justice that our current consumption standards and increasing numbers impose. It is at this point that the moral concerns of the population problem begin to manifest themselves. Will the rich countries lower their accelerating levels of consumption, not because of pollution problems nor the depletion of earth's resources which technology can mitigate if not solve, but because they do not believe that the world can continue one - third rich and two - thirds poor? Will the rich in our country, and that includes all of us in this conference, because we the educated minority earn the same kind of rent as the landlord and the industrial magnate does—will we accept a cut in our incomes and expenditures, not because we cannot produce all that we, the well-to-do need, but because we are revolted at the fact that the majority of our countrymen, women and children are living in abject misery and we want them to live a life of sufficiency. In the end the population concern for me is a moral concern. When I was born 64 years ago in this sub-continent of what is today India, Bangladesh and Pakistan 300 million persons lived. Today in this same land area we are over 700 million people. And so when I was a boy it was possible for my parents and me to share what we had with our neighbours, to laugh with them in their joys, cry with them in their sorrows, to be honest, pay our taxes, settle our quarrels and differences and plan and fight for our freedom. Today all this has become twice as difficult. I have twice the opportunity to quarrel, to cheat, to evade taxes, to smuggle, to bribe and be bribed. I have twice the number of people to be honest with, to be friendly and neighbourly to, and to love, that is to feed the poor and hungry, to visit the sick and comfort the bereaved, and also more than twice the land and property and wealth to give up. In the final analysis population is our concern because it poses the moral problem of practising the values of honesty,

integrity, compassion, non-violence and charity to an ever growing number of men, women and children in this our dear land and in this our crowded planet.

Criteria :

What criteria, what yardsticks should we bring for action on this concern of ours about people? I would suggest that we approach this problem of people and population with the two endowments with which human beings have been gifted. The first is rationality. We are endowed with reason with which we are enabled to acquire and transmit our knowledge, with which we are able to examine, discuss, analyse and synthesise any situation that controls us and with which we are able to build a heritage of wisdom and avoid the pitfalls of unreason and folly. And so let us bring to this concern of ours the unique quality of rationality. The second endowment that is ours is responsibility. We are responsible to our families, to our religious group and hierarchy, to the State and country and the world community. Even more important we have responsibilities for a whole network as parents, spouses, citizens, neighbours, and members of societies and groups. It is at this point that we enter the moral realm—the realm of charity, integrity and all the values built into us as human beings which is the ultimate yardstick for the positions that we take on this and every other issue.

Action :

Using our reason and responsibility, . would like to close with some suggestions for our individual and group action with regard to population as our concern. The first suggestion that I would make is to reason out the subject of this conference each one for herself or himself—that population is our concern, is everyone's concern, that it is not the concern of the government, or the church, or the demographer, or the social scientist except in so far as it is the concern of each and everyone of us. This first action is not an act of faith but the fruit of reason. It means that the first call to each one of us is to study the question in all its seriousness and in its wholeness. For us in India the Indian Association for the Study of Population has just brought out a publication—Population in India's Development 1947-2000—which deals with the whole set of relationship between population and our entire development process. It will give us knowledge of a wide range of issues, population and the quality of life, Population and inequality, population and poverty, population—child care and development, population and our natural resources, our planning and growth prospectives, migration and urbanisation and basic population statistics, as well as the problems of mortality, fertility and family planning. I would suggest that in the first round of reading the last section on family planning of 90 pages in this book of 450 pages might be skipped in order to equip ourselves intellectually on the population question.

A Second suggestion is to diffuse this information on population as widely as possible through the various educational agencies that we have —our schools, colleges, teacher - training institutions, adult education and literacy programmes, our associations such as yours, through plays, folk art, film, radio and T.V. If this information is important, if it is everyone's concern then having acquired the information we cannot keep it to ourselves. For like all knowledge, it is the only form of riches that increases only as it is given

away. That is one aspect of our responsibility as the small privileged minority of educated citizens in this country, where the majority do not have access to such information.

A third suggestion is for each of us on the basis of this knowledge and as a family to decide freely and responsibly the size of our own families and use the means known, available, and acceptable to us in attaining that size. For us in India there is no alternative to restricting the size of our families— the number of children each of us as a family should have. The means we will follow to attain the size will depend on our knowledge and moral convictions. It will lead some to use what is called the natural rhythm method. It will lead others to use the technologies available to us today—contraceptive aids, sterilisation and in some specific cases, abortion. This choice is fortunately available to us, the small educated minority.

But there is also a fourth area of action— what of our poor, semi-starved, disease prone, illiterate masses. What are we going to advise them, because we have to share with them the means for restricting their families.? And what are we to advise our government and government agencies on this question of making available to the masses of our people the information and the methods for realising the small family norm which we as a country have accepted. Here we can start with measures that all of us can agree upon. One is to raise the age of marriage so that the average age of marriage for a boy is increased from 16 years to 21 years and for a girl from 15 to 18 years. Every one year of postponement of marriage reduces the children born in the country by 10 per cent. A second action is for all of us to help improve the status of women and the quality of family life in our country. We have a committee set up by the government which is studying and recommending improvement in the status of our women, who under our constitution, are equal in rights and dignity with men. In fact however they suffer many discriminations and have little or no say in important matters, in public, professional and family matters. To start with we should ensure that girls have the same educational opportunity as men. Their education should be as vocationalised as that of men so that they have equal employment opportunities. Their status in inheritance, in marriage, in public life and the family should be that of equals. In particular they should join with their spouses in freely deciding all matters concerning the family, employment, schooling, the number and upbringing of children. Incidentally I have the feeling that part of our population acceleration is due to the non-employment of the rich women power that we have in the country. A third action that we can take is to improve health and child care facilities so that the first born child is certain to live, which means providing the pregnant mother and the pre - school child with adequate nutritious foods, and immunization. A fourth action relates to making known and available information and facilities for limiting the number of children and the spacing of the births. Here we should face the dilemma as the Indian Council of Medical Research points out that the present state of Bio - Medical Research is such that we do not really know very much or very precisely about what His Holiness Pope Paul VI in his encyclical Humanae Vitae calls " the infecund periods", and in which he calls on medical science to provide " a sufficiently secure basis for the regulation of births founded on the observance of the natural

rhythm. In this situation of scientific uncertainty to date, it is not surprising that the countries which rely for regulation of their births on the rhythm method are also the countries where there are the highest rates of illegal abortions, with their disastrous effects on the women and families, particularly from among the poor majority, and even more serious, spiritual disintegration of the human persons involved. We have each therefore to decide whether we will help our people to know and use the various methods now available in our country — the contraceptives, the sterilisation and pregnancy counselling and abortions so that they can exercise the right to choose the size of their families and have the number of children they decide and no more, and so can give their children the minimum health, food, education, parental care and spiritual guidance to which all children everywhere are entitled. I know that this is an issue on which we can argue till the cows come home, as to what is the moral order, what is the meaning of marriage and what is responsible parenthood. For me there is no contradiction between these basic issues and the small family norm and the means for its realisation in the crisis condition of our country.

But this crisis condition is basically due to our stagnant economic system and our unjust social order. The population problem only aggravates this crisis. It is for this reason that the Sodepax Conference concluded its deliberations on population with the statement : " It is therefore a matter of great urgency to take action which recognises the dynamics of the population problem but of course with due regard for the necessity that such action be integrated with development programmes". Our concern for population should drive us—each of us and all of us—to help our economy to become more productive and to change our society so that the roots of its inequality are removed. That is what development means—the development of the 280 million poor people in our country and it is to that that our conference theme-'Population, our concern,' calls on all of us, for rational and sustained action. Let us respond to that call.

—

COUNTERING STAGFLATION IN THE INDIAN ECONOMY*

Introduction :

The participants decided to concentrate on the specific issues of stagflation, defined as the co-existence of inflation and stagnation. It was felt that the two reinforced each other and that a solution lay in making a major effort towards increasing production, particularly of wage goods, and employment. The participants were of the view that the supply side was of greater relevance to the quest for solutions to the problem.

Monetary And Fiscal Policy

1. The Round Table was of the view that the topmost priority in combating stagflation should be given to measures to increase savings and ensure their effective utilisation. The household sector offered greatest potential. The mobilisation of resources from this sector would depend on the use to which resources were put, with specific reference to their capacity for employment generation.

2. The Seminar advocated the judicious use of fiscal incentives to boost the rate of savings in the household and corporate sectors. An effort was also necessary to resuscitate the capital market, though it formed a small part of the total mobilisation effort, as its wider aspect could no be ignored.

3. It was suggested that net savings i.e., current savings net of disinvestment should form the base for fiscal incentives without any ceiling.

4. There was considerable scope for broadening the tax base by taxing agricultural incomes as also through appropriate pricing of agricultural inputs like water and power. A major leakage in the tax net was through evasion of excise dutied which could be effectively plugged by linking bank credit to excisable output.

5. There was general agreement that the present structure of interest rates distorted investment patterns and led to inefficient ane wasteful use of capital. There was no incentive to use labour intensive rather than capital intensive methods of production. There was divergence of opinion as to the the impact of the present high bank lending rates on industrial production. It was emphasized that a very large proportion of the bank revenues (as well as revenues of institutions like the LIC) were being eaten up by increasing operational costs.

6. A suggestion was advanced by one of the participants that international monetary flows, including commercial credits, comprised a major source for augmenting domestic resources for investment.

Industrial Production

1. The need for re-orienting the policy framework was underlined. The Seminar urged a shift in emphasis from the present regulatory approach to one that would promote rapid growth of industrial pro-

* Declaration of the 2nd Round Table of Economists held in Bombay on February 1 and 2 attended by: 1. Dr. Malcolm S. Adiseshiah, 2. Shri. S. Bhoothalingam, 3. Prof. M. L. Dantwala 4. Prof. Hannan Ezekiel, 5. Shri L. C. Jain, 6. Dr. H. K. Paranjape, 7 Shri H. T. Parikh, 8. Dr. N. A. Sarma, 9. Shri Viren J. Shah, 10. Shri Minoo R. Shroff, 11. Shri. N. K. Somani, 12. Prof. V. B. Kamath.

duction while maintaining basic minimum controls.

2. The broad objectives should be spelt out clearly and unambiguously and the administrative procedure simplified such that a minimum reference to the Government would be involved in the operation of the policy. Whatever structural or institutional changes were considered desirable should be clearly made known and speedily brought about; but after doing this, the individual industrial units should be permitted to operate according to the logic and rationale of their own capabilities, and not hindered or restricted at every step on any other ground.

3. The plethora of irrational and unnecessary controls had hampered the growth of industrial output and undermined managerial initiative. The Seminar reiterated that controls should be reduced to a minimum. Too frequent changes in the policy should also be avoided to enable industry to plan ahead in an atmosphere of stability.

4. It was noted that historically a political event such as Bangala Desh or an economic factor like the green revolution had acted as a restorative in periods of industrial stagnation. Some participants were of the view that an event like the recent successful strike of oil may prove to be a very effective morale booster.

5. Inefficient management of infrastructural facilities like power was a major contributory cause to the present stagflation. Such bottlenecks would have to be overcome speedily if industrial output was to be revived. In the short term, it was felt that every effort should be made to maximise capacity utilisation, particularly in the non-traded areas. Pointed reference was made in this connection to the inordinately long gestation periods in areas like power and coal where better management could accelerate the process of industrial revival.

6. Most participants felt that inadequacies of management were responsible for ineffective utilisation and emphasised the need for a proper system of incentives positive and negative—to operate both in public and private sectors,

Agricultural Strategy

1. The Seminar stressed the importance of contingency planning, keeping in view the highly uncertain nature of the monsoons and the fact that 75 percent of cropped area was still rain fed. It was also urged that the maximum efforts should be made to tap ground water resources. National river resources should be taken out of the realm of controversy by transferring them to the Central List to facilitate the optimum utilisation of the vast irrigation potential they offer.

2. Greater attention to dry farming was also called for, as also for adequate allocation in irrigation projects for the construction of canals. The need to streamline the distribution of inputs was also underlined. While there was broad agreement on specific measures, some of the participants were skeptical of any significant breakthrough being achieved in the next two years.

3. The Seminar deplored the neglect of coarse grains, pulses and oilseeds, noting that undue emphasis had been placed on the main cereals. It expressed regret that no technological breakthrough had been achieved in regard to evolving high yielding varieties in respect of these and they urged that research in these areas should be intensified.

4. The present uncertainity over land holdings was a deterrent to the growth of farm output. The regularisation of land records, which would have the benefit of

ensuring security of tenure, was a measure which brooked no further delay.

5. The potential offered by forestry had not been adequately tapped. To this end, the Seminar called for a shift in emphasis from the present conservatory approach to a deliberate and systematic promotion of developmental forestry.

Employment

1. While noting that no precise estimates were available on the magnitude of unemployment, and under - employment, the seminar firmly believed that the mobilisation and effective use of the unemployed and underemployed manpower resources was imperative for eradicating poverty and achieving distributive justice.

2. For this purpose, considerable emphasis on preparation of district Plans on the basis of actual working out of development possibilities with the use of locally mobilised resources has to be laid. Unless a very big effort in this direction was undertaken, a genuine breakthrough in this sphere would not be possible. The restructuring of the educational system to give it a more functional bias would aid greatly in this effort.

Exports

1. The Seminar underscored the importance of export policies to achieve viability on the balance of payments front. The need for revamping the policy perspectives to this sector to maximise exchange earnings was emphasised. It was pointed out that there was substantial scope for expanding exports.

2. Talking of non-traditional areas, it pointed out that engineering items, leather goods, marine products, bullion, cement, sugar and iron ore (pelletised) offered considerable growth potential. It was generally felt that a concerted effort must be made to develop export surplus in these areas, if necessary even by curbing domestic consumption.

3. It was also suggested that joint ventures could form an important vehicle for expansion of exports and the augmentation of exchange earnings and more importantly for getting India's industrial prowess more widely known.

4. In framing the export policies, it was emphasised that maximum weightage should be given to items which had a minimum import content. An exercise is also needed to be undertaken to identify areas of further export growth with a view to creating and expanding industrial capacities directly linked to export production. The present static approach to exports should give way to a dynamic policy.

5. Exports and imports are two sides of the same coin. Even as every effort is made to boost export growth, the possibilities of cutting down on imports should be vigorously pursued, both in terms of conserving foreign exchange and augmenting investible resources. The Seminar felt that the major areas which offered significant scope in this regard were food, petroleum, steel and fertiliser.

Climate for Rational Decision Making

The Seminar was of the view that the decentralisation of the administrative apparatus was a primary pre-requisite for the eradication of poverty. However, a more egalitarian economic and power structure was needed to achieve this. Mass poverty and democracy cannot possibly co-exist for long Eradication of large inequalities and conspicuous consumption were necessary in order to improve the climate in which hard work and high productivity became important values.

BOOK REVIEW

(i)

Economics of Rural Change—A Study in East India,

By

G. C. Mandal and Associates of the Agro-Economic Research Centre, Visva Bharati University, Santiniketan.

Publisher : Firm K. L. Mukhopadhyay, Calcutta, pp vii+122 Price Rs. 30.00, 1974

This book contains a study of the Economics of rural change in East India comprising the States of West Bengal, Bihar and Orissa. It sets out to discover what changes have been taking place in the rural parts of these States as a consequence of the planning and development activities undertaken by the State agencies. The study also includes the quality of the changes, their pace and pattern, their process and further possibilities of changes.

The first part of the analysis is based upon the data collected through survey and resurvey of 19 villages spread over the three Eastern States, conducted by the Visva-Bharati Agro-Economic Research Centre with reference to particular forces of change, e.g., Community development programme, urban industrial development, irrigation etc. The villages were first surveyed between 1956 and 1959 and then resurveyed between 1962 and 1967.

The second part of the analysis relates to the period since 1966 which witnessed some really productive efforts under the national development programmes and it incorporates the results of some special surveys conducted by the Visva-Bharati Agro-Economic Research Centre during 1966-70. This part of the study covers the Intensive Agricultural District Programmes, High Yielding Varieties Programme, Potato Cultivation, agricultural enterprise in West Bengal, Pilot Co-operative Farming Societies, small and marginal farmers and landless agricultural labourers, etc.

After outlining the environmental conditions and social framework of the villages concerned in the first two chapters aspects like landholding, farm size and agriculture inputs, the cropping pattern, yield rate and output are dealt with in the next two chapters. Marketed surplus is taken up in Chapter V, while literacy and education is discussed in Chapter VI. Chapter VII contains an analysis of income, Consumption and Borrowings, the VIII Chapter of Part I presenting a summary of the village studies. Part II consists of Chapters IX and X, the farmer focussing on developments in specific sectors as well as the new technology, and the latter containing the summary and conclusions, by way of implications for future development.

The analysis presents a large number of statistical tables pertaining to population, workers, holdings, yields, literacy, marginal productivity, per capita income, indebtedness, output and input, level of participation, HYV coverage, cost per acre etc., in addition to two diagrams depicting Lorenz Curves for the distribution of Net Revenue for two crops in two areas. A few appendices have also been put in, offering special information on labour-productivity function, the green revolution and list of village studies made for this analysis.

It is to the credit of the Visva-Bharati University Agro-Economic Reasearch Centre that it has ventured to make a critical

study of the economics of rural change in a part of the Country which on all hands is considered to be agriculturally backward, and excepting West Begal, is characterised by low urbanisation, and low level of literacy when compared with the all India averages.

The study has brought out the change in the position between the original survey and the resurvey in the concerned villages. One aspect of the change was the fall in the model size-group of farms commanding the largest proportion of operated area from 5-10 acres and 10-20 acres to 2.51-5.00 acres in many villages. Also it was found that concentration ratio is smaller in the case of operational holding compared with ownership holding, thereby implying that there was more equality in the opportunity for leasing in land to make a viable farming unit than for actual ownership.

Among the factors contributing to enhancement of farm-income improvement of yield rate and increase in intensity of cropping were noticed as important. Yield rate, however, seemed the more important factor. The actual regression equation derived from the data gathered, indicated that 56 percent of rhe increase in the gross rate of return per acre is due to increase in the yield rate and the rest 44 percent is due to increase in the intensity of cropping. Conditions in Tamil Nadu seem to be parallelled in the area studied in that it was noticed that a slight improvement in the yield rate of the major crop like paddy over an extensive area could bring about a considerable rise in farm-income. The main impediment to increasing the intensity of cropping has been noticed to be, as in Tamil Nadu, inadequate facilities of irrigation limiting the scope for increasing the intensity. The lack of perennial irrigation sources was the actual bottleneck.

From a comparison of the percentage increase in gross rate of return per acre with the percentage of increase in population during the same period in more than half the number of villages studied, the author concludes that the rate of increase in gross return was higher than the rate of increase in population. This is taken as proof of the positive contribution to crop-output made by the incremental labour force. But it may be doubted whether, with surplus labour in agriculture, the increased output should be attributed to the marginal product of labour or to the use of modern inputs like fertiliser, better seeds and extension methods in a greater measure than before as witnessed in these villages. It may be that Table 46 on marginal productivity of labour does not provide a conclusive test of this proposition of the authors.

We can agree with the author that the Green Revolution should not be reduced to merely a revolution in rice but that must be treated as a step towards regeneration of the farm-structure and the rural economy. On the whole one gains the impression that the study has been well conceived and the results have brought to light significant findings on rural change in a part of India. Such studies may be carried out in other parts of India too with benefit to the academicians, researchers, planners and administrators.

T. C. Mohan

Review of The Book "Minor Irrigation in Tamil Nadu"

By

G. VENKATARAMANI,

Madras Institute of Development Studies, Adyar, Madras-20.

Publishers : Sangam Publishers, Madras. pp IX + 120. Price Rs. 20/-

Even after 25 years of planning, agriculture continues to be the predominant sector in Tamil Nadu, contributing 41 percent of the State income and employing 61 percent of the working population. The State has made some notable progress in irrigation and productivity, particularly in paddy. The net Irrigated area increased from 2,417 thousand hectares in 1968-69 to 2,816 thousand hectares in 1972-73. As of today in irrigation Tamil Nadu is in the forefront of the nation next only to Punjab. Yet, the dry farming area subject to the vagaries of the monsoon consititutes about 56 percent of the total area sown and 50 percent of the farmers are dry farmers. Although the State has in recent years achieved self-sufficiency in foodgrains mainly due to increased productivity in paddy cultivation, the fortunes of the farmers are still closely bound up with the vagaries of the monsoon. The current situation shows that the onslaught of a drought in a single year can quickly turn a precarious surplus position in foodgrains into one of acute food shortage. The effective solution to the unpredictable weather is more irrigation. However, the water resources of the State are limited and Cauvery is about the only perennial river whose irrigation potential has been fully exploited. All the possible major and medium irrigation projects, which received almost the exclusive attention of the government during the early years of planning, have been completed. Therefore, further development of irrigation facilities in the State is dependent upon (1) creation of projects like Godavari-Cauvery link and Ganga-Cauvery link and the creation of regional and national water-grids and (2) utilisation of surface and ground water by constructing minor irrigation schemes. The monograph under review deals with the problem of minor irrigation and attempts to justify the extention of minor irrigation schemes on the basis of their contribution to productivity.

The book contains five chapters under the headings : 1. Framework of the study; 2. Cropping pattern and agrarian structure; 3. Minor irrigation : retrospect and prospect; 4. A note on dry farming in Tamil-Nadu and 5. Recommendations. The third chapter, which contains the empirical findings, is the substantive part of the book; the rest is decorative window-dressing which, of course, has its uses and has been done and displayed with considerable craftsmanship.

Realising that the scope for major and medium irrigation projects was exhausted, the government began to pay increasing attention for the execution of minor irrigation from the Third Five Year Plan. Consequently the share of the minor irrigation projects was increasing and during the last decade over 76 percent of additional area brought under irrigation was due to minor irrigation. However, between 1961 and 1971 the net area irrigated had not shown much improvement indicating that the irrigation

programme was insufficient to keep up with the increase in the net area sown. The author argues that the solution for placing agriculture on a stable footing lies in eliminating inefficiency in the operation of the existing minor irrigation schemes and executing additional schemes for the scope for further major and medium irrigation projects is practically non-existent. The usual norm of defining minor irrigation schems in term of financial outlay is abandoned as meaningless in view of the continuing inflation and a more rational definition in terms of the capacity of the irrigation schemes is adopted. Accordingly minor irrigation works are defined as all schemes irrigating not more than 1,600 hectares comprising open wells, tube-wells or filter points, small irrigation tanks, small canals taking off from small streams and individual lifting or pumping schemes from rivers, nollahs or drains.

The Justification for such minor irrigation schemes is their contribution to productivity which is computed by a regression model and benefit-cost ratio. The author works with a simple regression model which makes productivity a function of irrigation alone. It is assumed that the relationship between the two variables is linear. The calculated regression coefficients show the existence of a positive relationship between productivity and irrigation leading to the conclusion that it is possible to increase productivity of land by harnessing in an optimum manner minor sources of irrigation. An Important omission in the regression analysis is the absence of any test to determine the statistical significance of the regression coefficients. If tested, the results are not given.

The cost-benefit ratio, worked out for a period of twenty-one years from 1951-52 to 1971-72 turns out to be 1.57 with 10 percent as the discount rate and this shows that the minor irrigation projects have been yielding economic returns on the investments made.

The author thus establishes the economic justification of the minor irrigation schemes on the basis of the direct returns alone made on such investment. The total returns of such investment including stabilisation of agricultural production, protective value afforded by irrigation, increased employment opportunities, etc., would be much higher than the commercial returns calculated by the author. In other words, the social profitability of the minor irrigation would be much higher than the commercial profitability of and on the basis of the former minor irrigation schemes could be justified even if the commercial returns are not high enough. The author has certainly kept in view the concept of social gains but has made no attempt to incorporate it in his statistical Investigation and for obvious reasons.

The book also considers the feasibility of developing dry farming technology as an alternative to investment in minor irrigation and concludes that dry farming technology and minor irrigation works are complementary to each other. It concludes by making a set of policy recommendations for increasing the minor irrigation projects and their proper execution. The major recommendations are: (1) the establishment of a district Water Management and Supervisory Council; (2) provision of more credit facilities to the farmers; (3) the establishment of R & D cells and the provision of extension services and (4) the integration of minor irrigation schemes with the overall plan.

The excellent preface written by D. Malcolm Adiseshiah bears the stamp

of a mature mind and a magnificent pen. The volume under review must be read by all those who are seriously interested in the development problems of Tamil Nadu.

Readers who are in a hurry may read the preface to obtain a good overview of the book.

T. S. Venkataswami

— —

MADRAS INSTITUTE OF DEVELOPMENT STUDIES PUBLICATIONS

publishers : (from whom copies may be ordered)
M/s. Sangam Publishers,
11, Sunkurama Chetty Street,
Madras-60001.

—

1. Books Published :

1. Income Earning Trends and Social Status of the Harijan Community in Tamil Nadu
   By A. Vagiswari (Price Rs. 12/-) Demy 8VO
2. Economics of Dry Farming in Tamil Nadu
   By R. K. Sampath and Jayalakshmi Ganesan
   (Price Rs. 15/-) Demy 8VO
3. Nutrition in Tamil Nadu
   By Rajammal P. Devadas (Price Rs. 15/-) Demy 8VO
4. A Guide to Research in Economics
   Edited by C. T. Kurien (Price Rs. 30/-) Demy 8VO
5. Land Reform in Tamil Nadu
   By G. Venkataramani (Price Rs. 15/-) Demy 8VO
6. Techniques of Perspective Planning
   Edited by Malcolm S. Adiseshiah. (Price Rs. 9.40) Crown Quarto
7. Plan Implementation—Problems and Prospects of the Fifth Plan
   Edited by Malcolm S. Adiseshiah. (Price Rs. 9. 40) Crown Quarto
   (Items 6 and 7 are a joint MIDS and ITES enterprise published by Tamil Nadu Government Press from whom they can be purchased)
8. Poverty and Wage Goods Supply in Tamil Nadu
   By M. Ramamurthy (Price Rs. 20/-) Demy 8VO
9. Women's Welfare in Tamil Nadu
   By K. G. Rama (Price Rs. 10/-) Demy 8VO
10. Minor Irrigation in Tamil Nadu
    By G. Venkataramani (Price Rs. 20/-) Demy 8VO

II. In print :

11. Small Fishermen in Tamil Nadu
    By C. Selvaraj

III. Future Publications :

12. Rural Employment in Tamil Nadu
    By J. Viswanathamurthy
13. Introduction to Mathematical Economics and Economics Statistics
    By N. Rajagopala Rao
    V. Lakshmana Rao
14. Rural Primary Education and Adult Literacy in Tamil Nadu
    By Alexander Joshua

Regd. No. M. 8831

MADRAS INSTITUTE
OF
DEVELOPMENT STUDIES
(M I D S)

The Institute founded and run by Dr. Malcolm S. Adiseshiah is a charitable trust registered under the Madras Charitable Trust Act.

The aim of the Institute is to contribute to the economic and social development in Tamil Nadu and India.

The activities of the Institute are:

— Studies and action-oriented research in micro-development problems;

— Documentation and library service in development programmes;

— Exchange and dialogue at the State, National and International levels on development issues;

— Publication of papers and research results of the Institute.

Printed by Aslami Printers, Arunachalapuram, Adyar, Madras-600 020
Editor: Dr. Malcolm S. Adiseshiah